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AND TO THE

APPLICATION OF GEOMETRICAL DRAWING FOR THE  
REPRESENTATION OF MACHINERY.

BY

**EDWARD TOMKINS, ENGINEER,**

*Whitworth Scholar.*

LECTURER ON ENGINEERING, QUEEN'S COLLEGE, LIVERPOOL.

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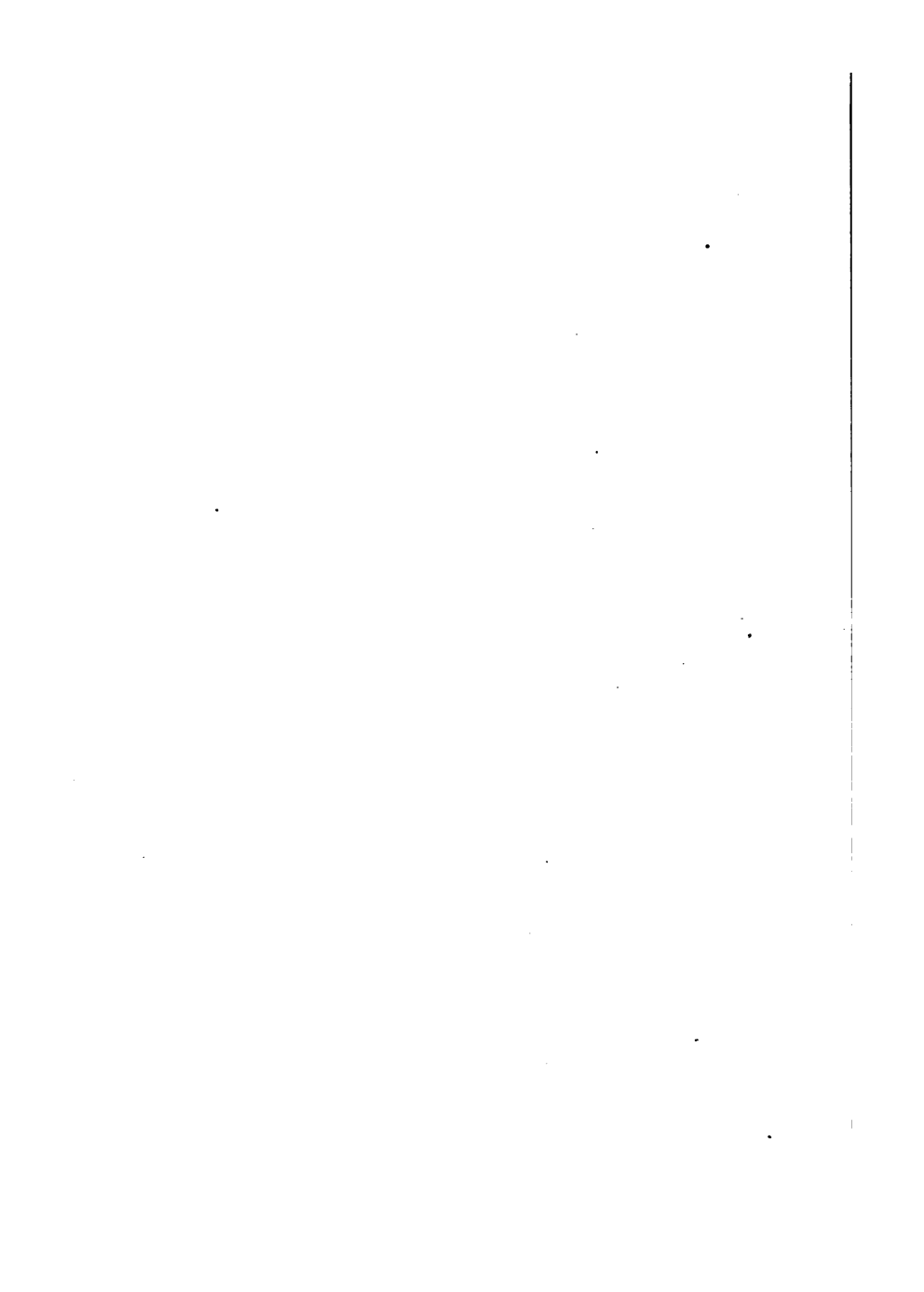


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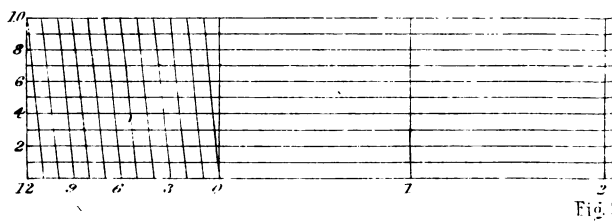
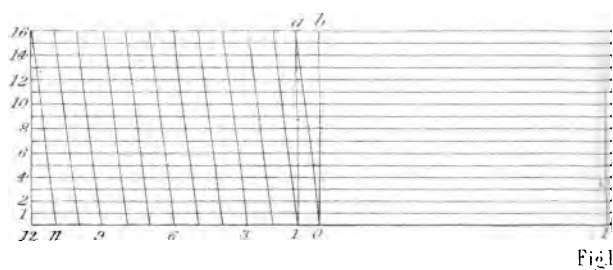
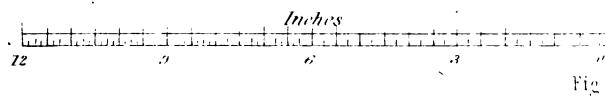
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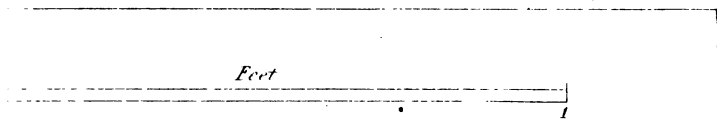








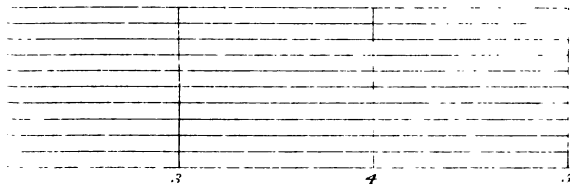
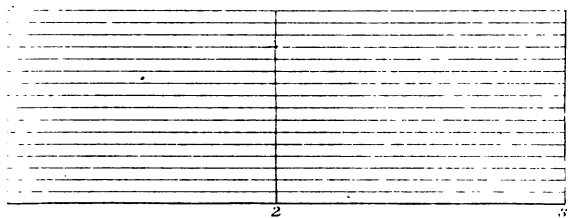
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2.



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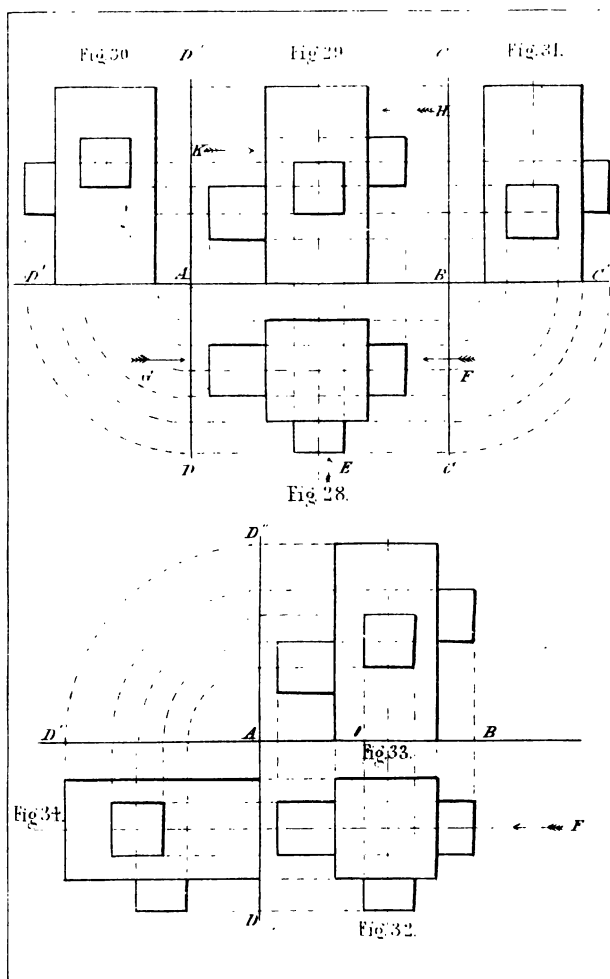
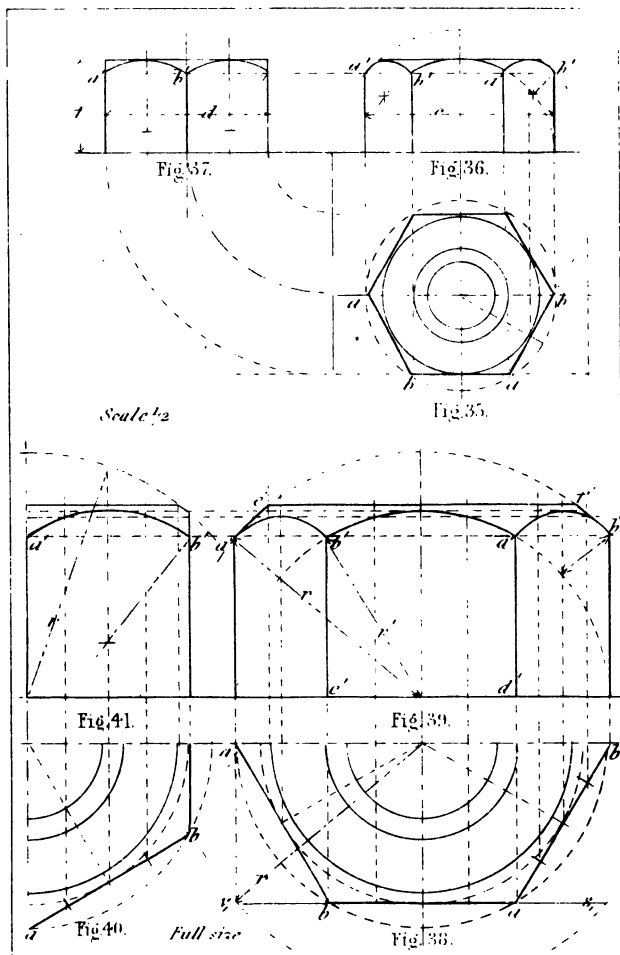
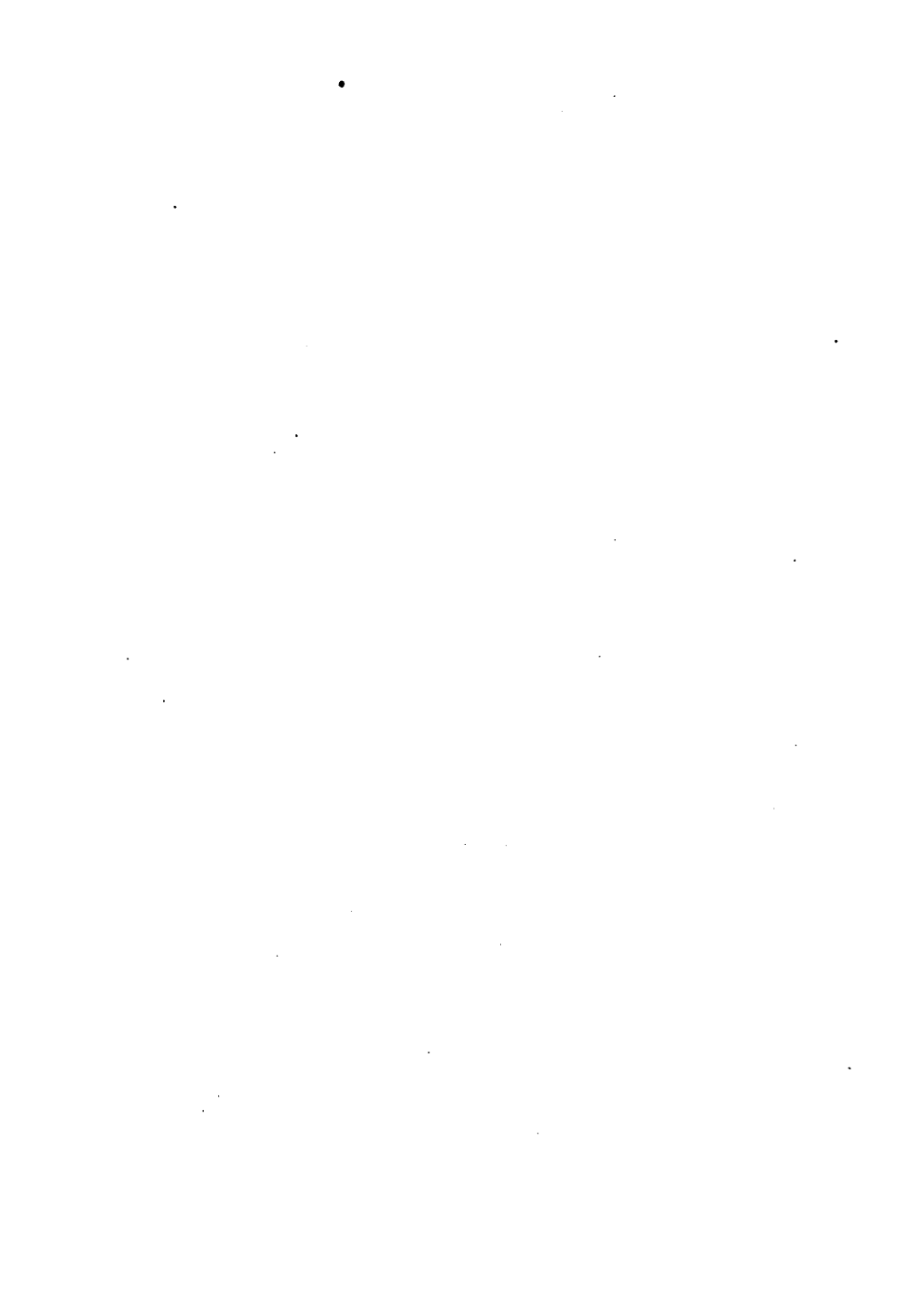


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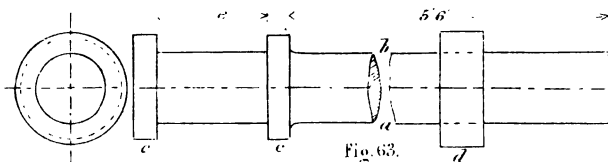


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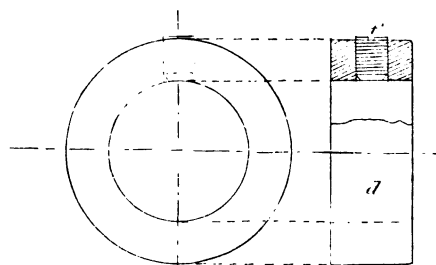


Fig. 65.

Fig. 66.

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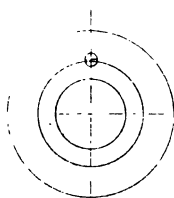


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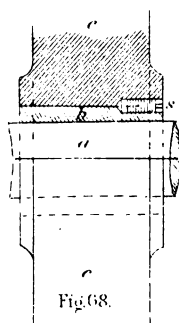


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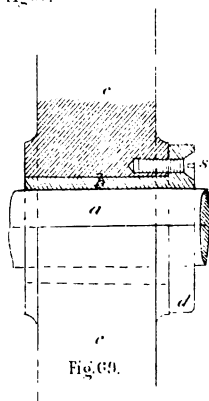
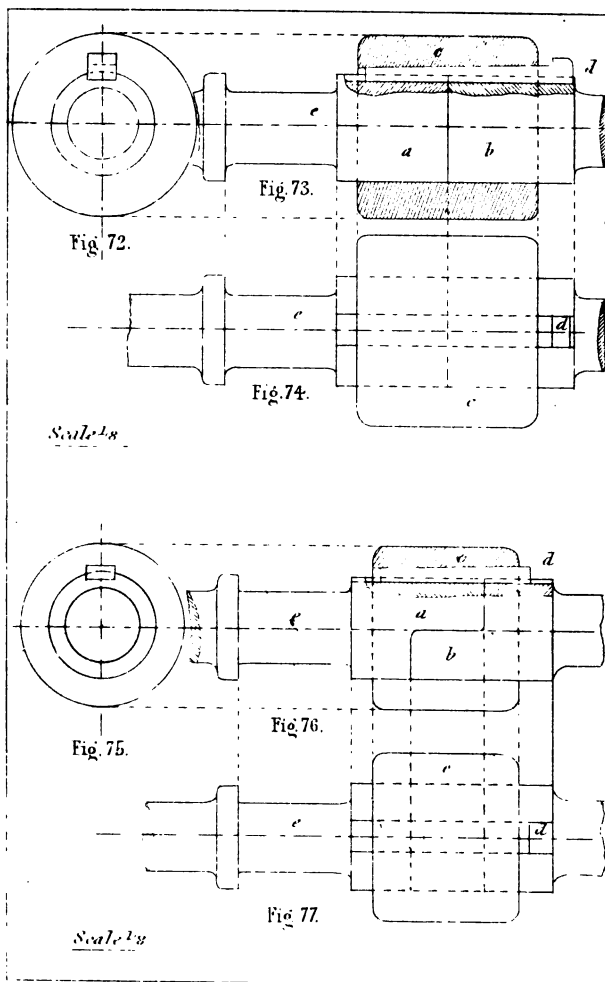


Fig. 69.

Scale 48"

Plate V









# Plate VI.

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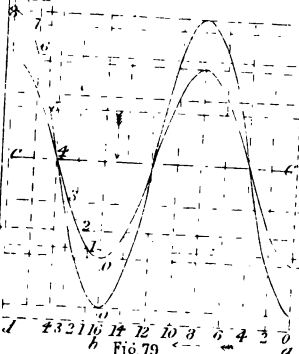


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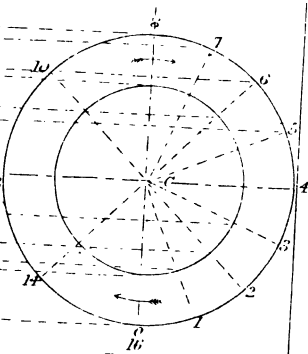


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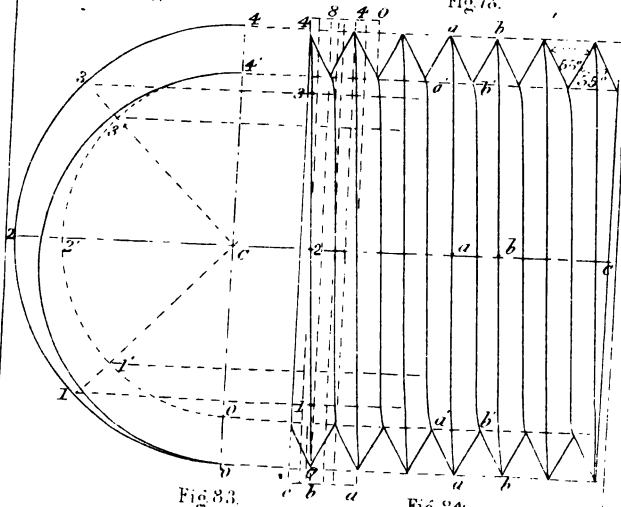
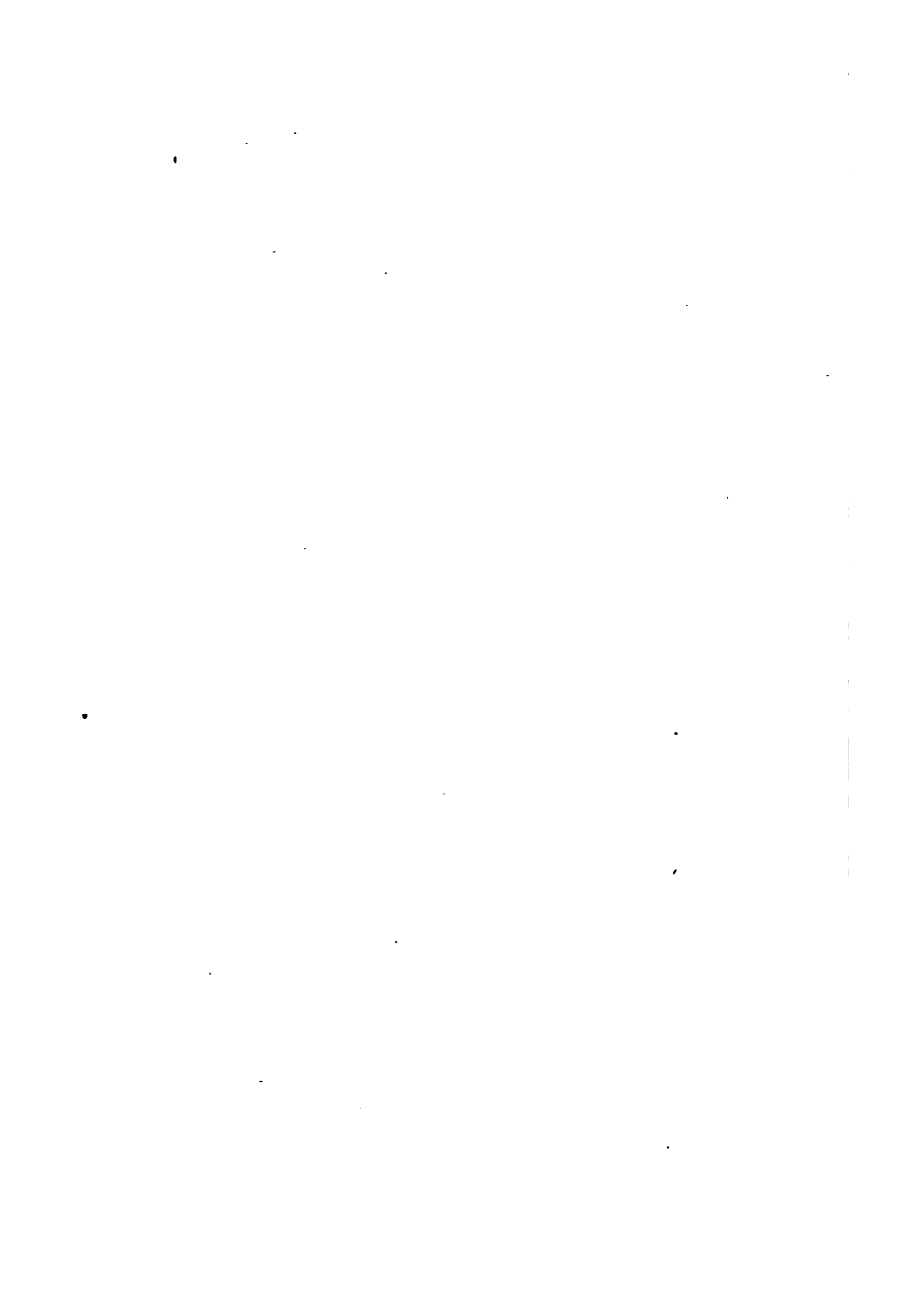


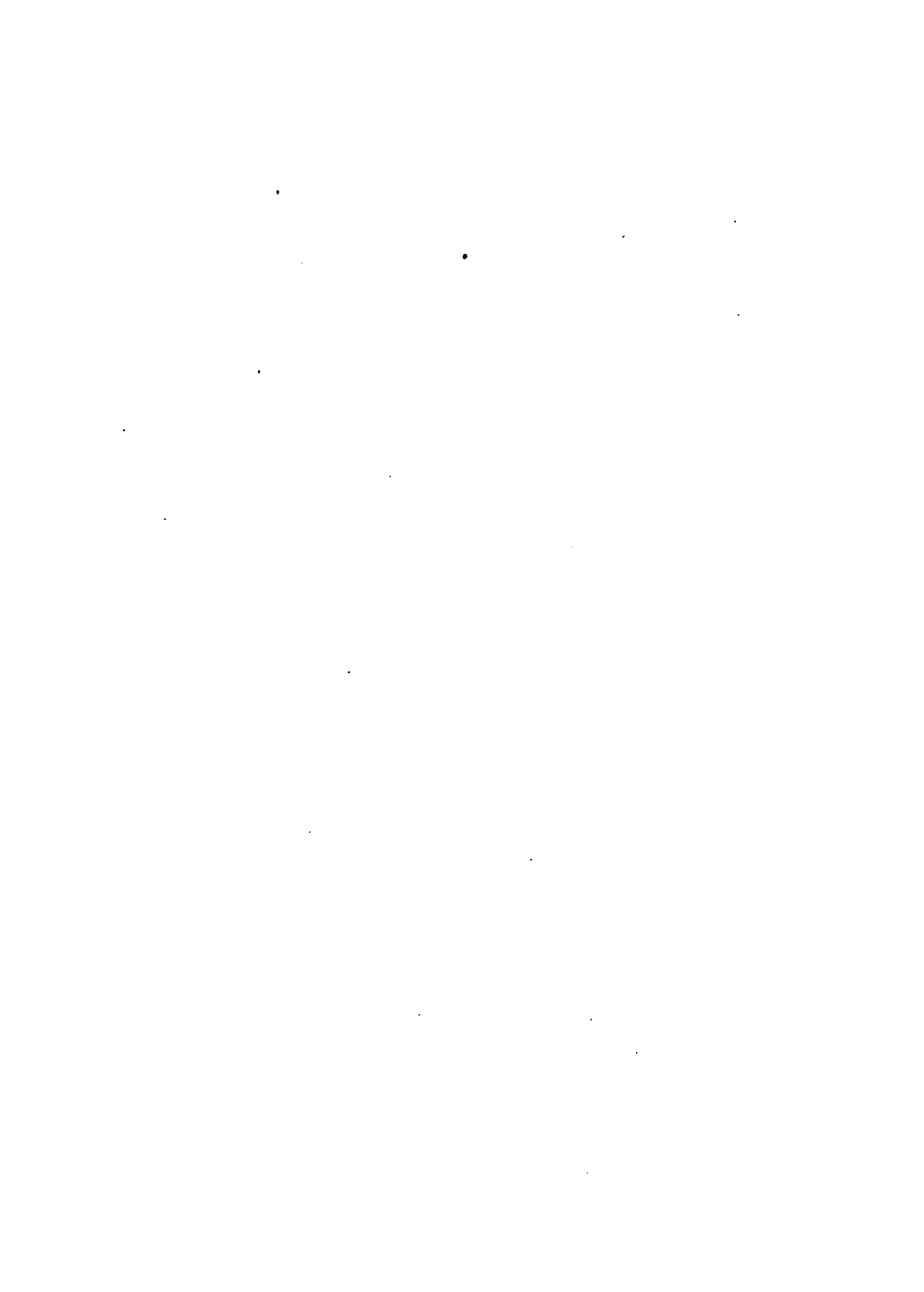
Fig. 83.

Fig. 84.

Full Size







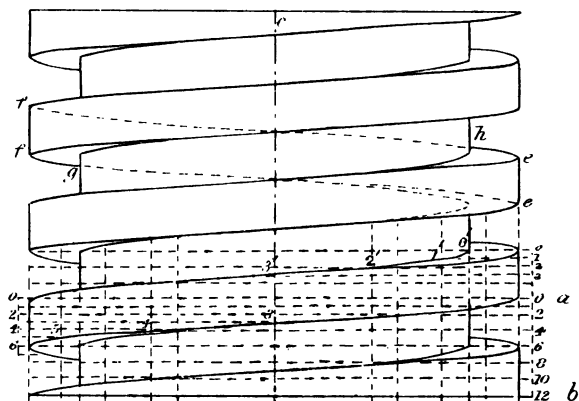


Fig. 87

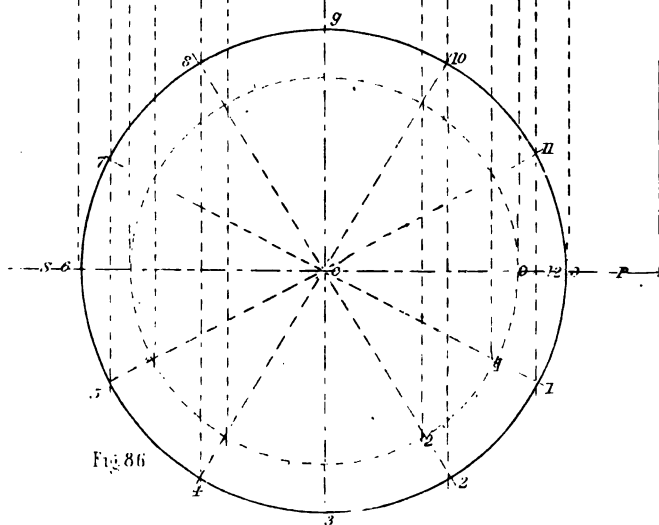


Fig. 86

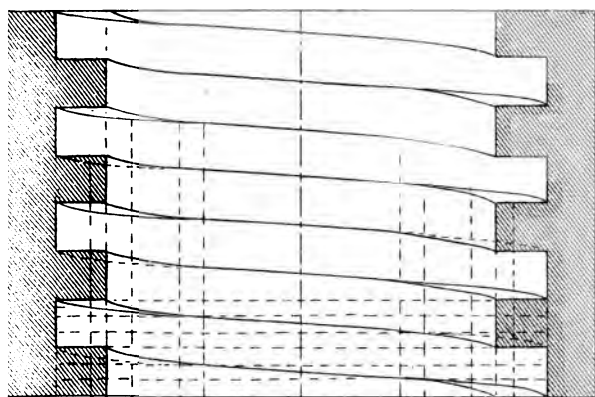


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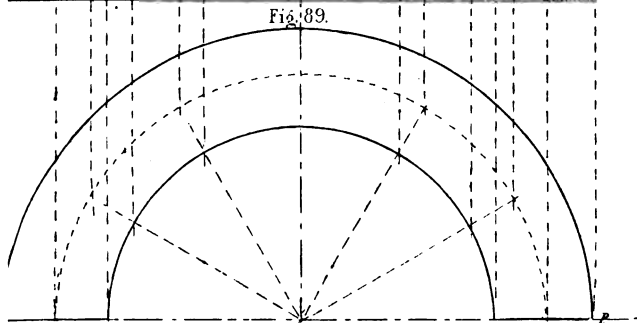


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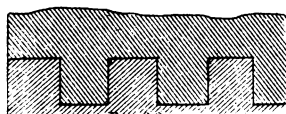


Fig. 90.

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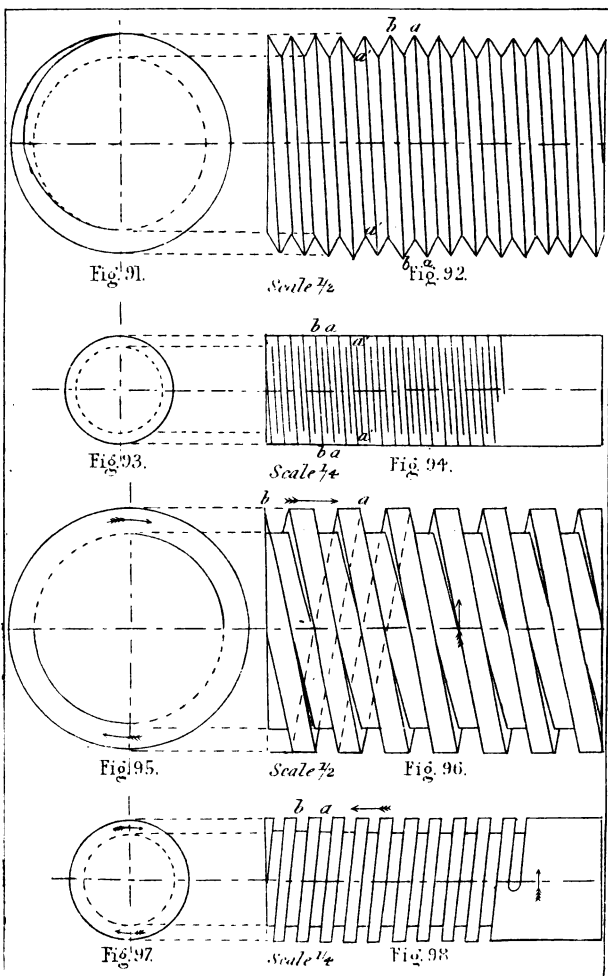


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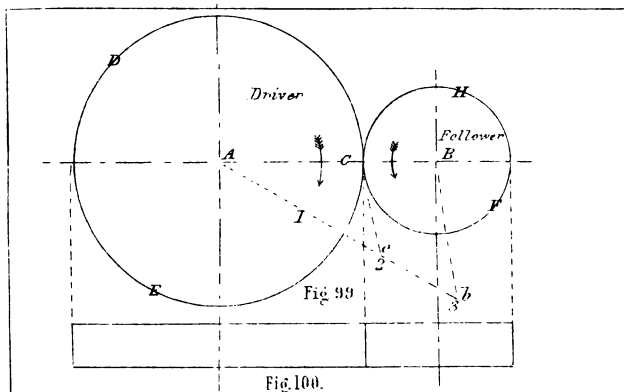


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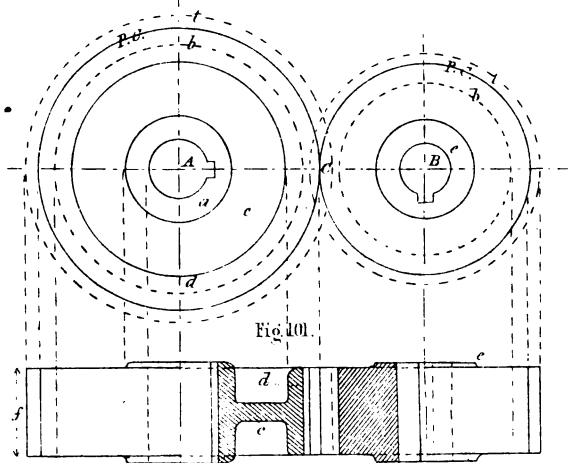


Fig. 102.

Scale: 1/4







Plate X.

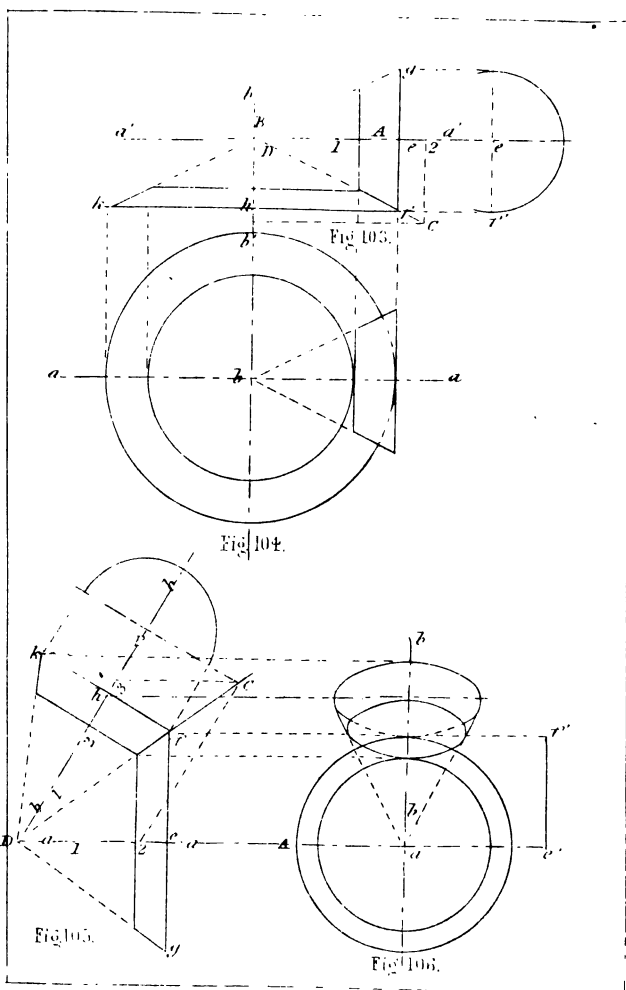
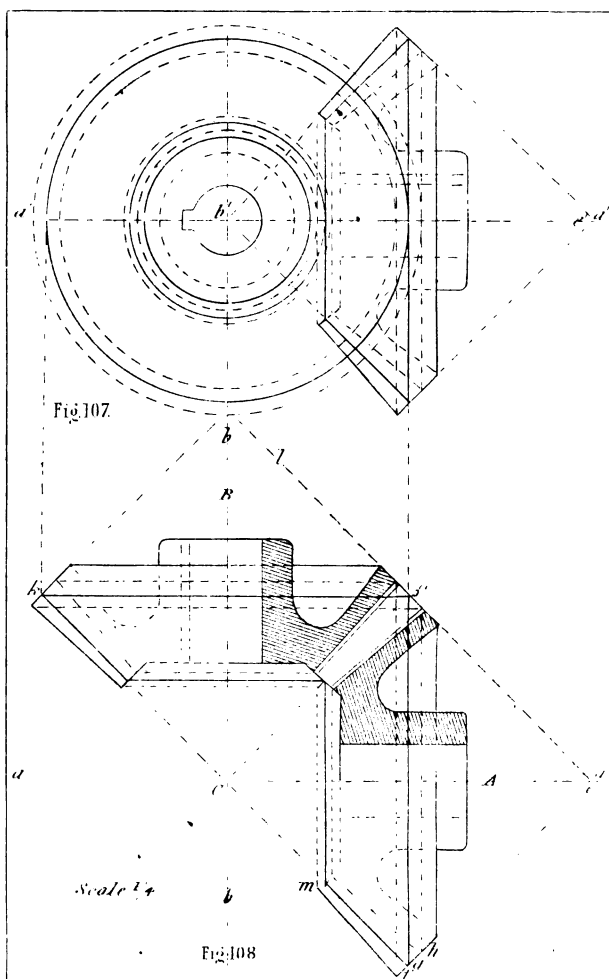


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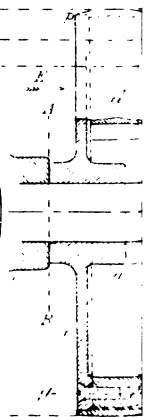
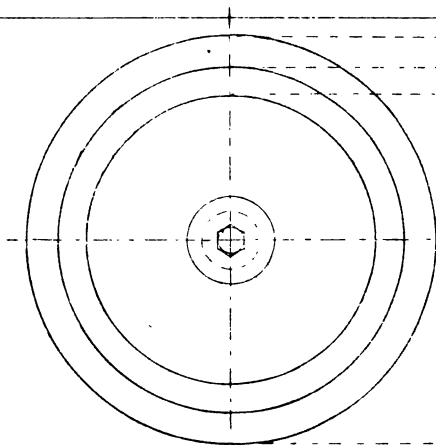
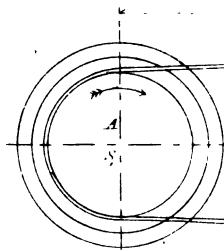
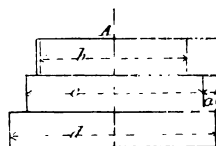


Fig. 117.



Scale 1/4"







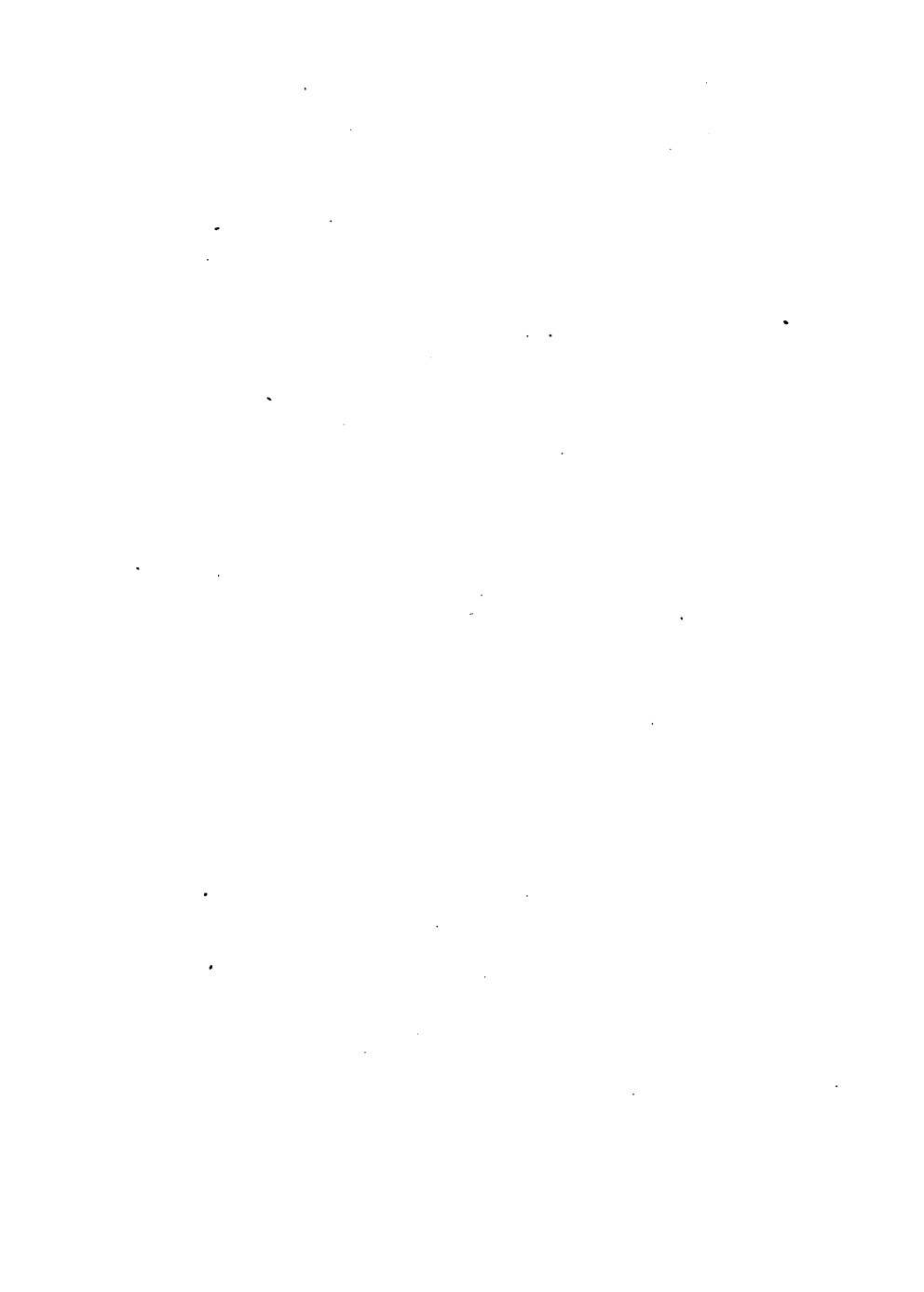
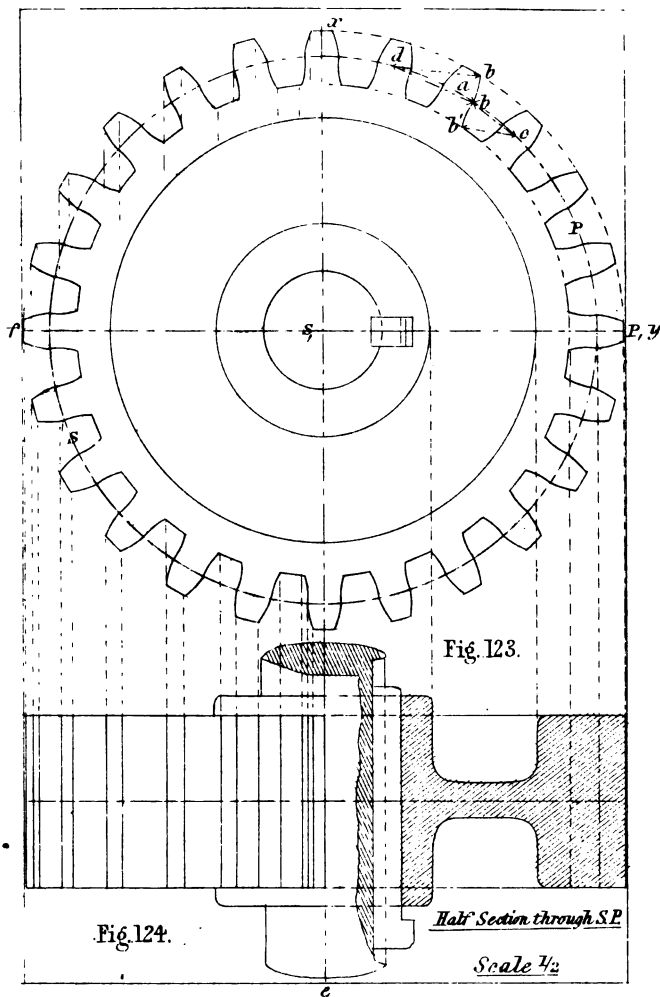


Plate XIII.



# Plate XIV.

## THE ODONTOGRAPH.

TABLES SHOWING THE PLACE OF THE CENTRES UPON THE SCALES.

### CENTRES FOR THE FLANKS OF TEETH.

Number of Teeth.	Pitch in Inches.							
	1	1 $\frac{1}{2}$	1 $\frac{1}{4}$	1 $\frac{3}{4}$	2	2 $\frac{1}{2}$	2 $\frac{3}{4}$	3
13	129	160	193	225	257	289	321	353
14	69	87	104	122	139	166	173	208
15	49	62	74	86	99	111	123	148
16	40	50	59	69	79	89	99	121
17	34	42	50	59	67	75	84	101
18	30	37	45	52	59	67	74	89
20	25	31	37	43	49	56	62	74
22	22	27	33	39	43	49	54	65
24	20	25	30	35	40	45	49	59
26	18	23	27	32	37	41	46	55
30	17	21	25	29	33	37	41	49
40	15	18	21	25	28	32	35	42
60	13	16	19	22	25	28	31	37
80	12	15	17	20	23	26	29	35
100	11	14	16	19	22	25	28	34
150	10	13	16	19	21	24	27	32
Rack	10	13	15	17	20	22	25	30

### CENTRES FOR THE FACES OF TEETH.

13	5	6	7	9	10	11	12	15
15	...	7	8	10	11	13	14	17
20	6	8	9	11	12	14	15	18
30	7	9	10	12	14	16	18	21
40	8	...	11	13	15	17	19	23
60	...	10	12	14	16	18	20	25
80	9	11	13	15	17	19	21	26
100	...	...	...	...	18	20	22	...
150	...	...	14	16	19	21	23	27
Rack	10	12	15	17	20	22	25	30

Scale of Centres for the Flanks of Teeth.

Scale of Centres for the Faces of Teeth.

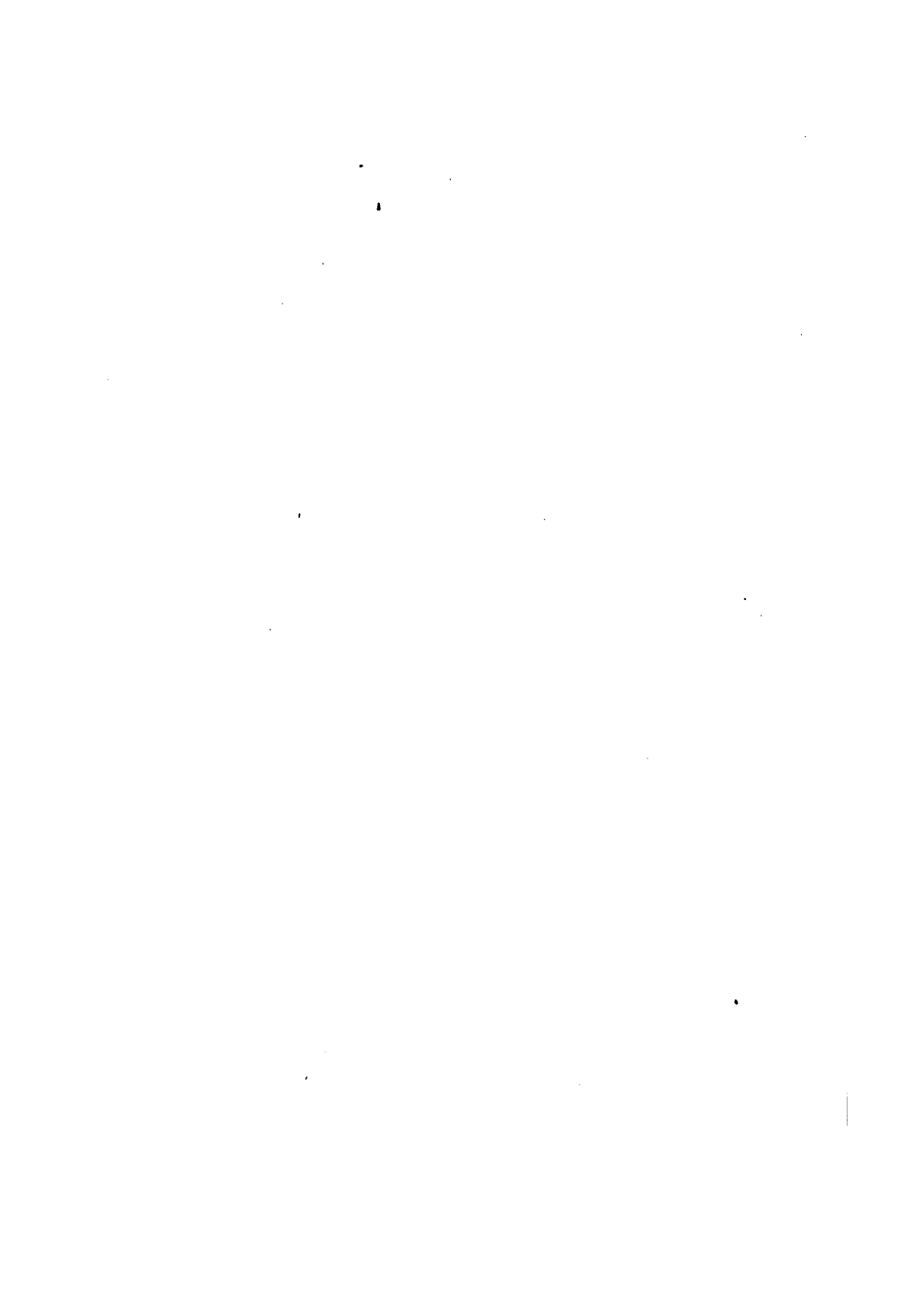
Fig. 125.

Scale  $\frac{1}{2}$

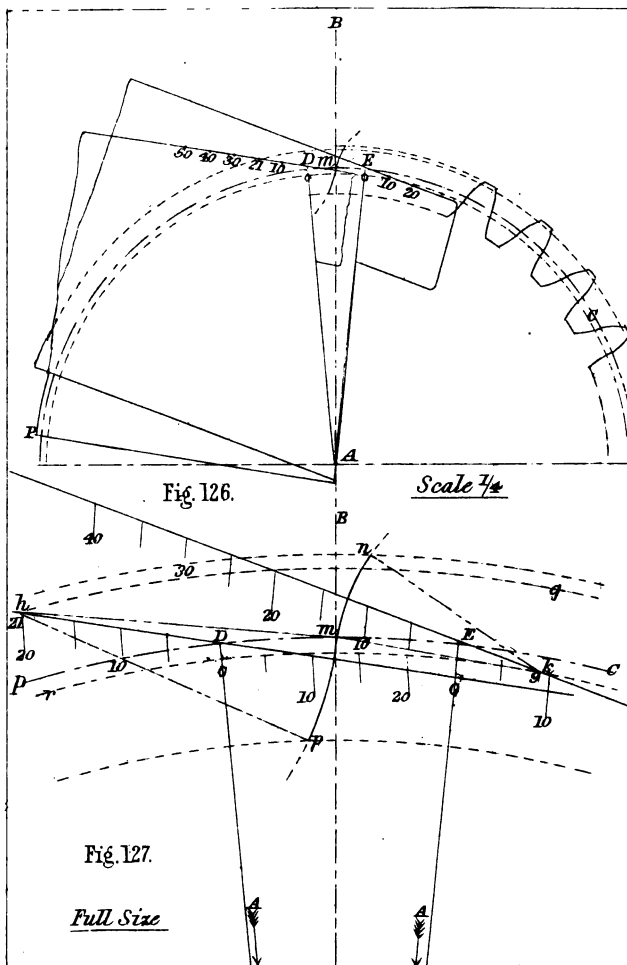
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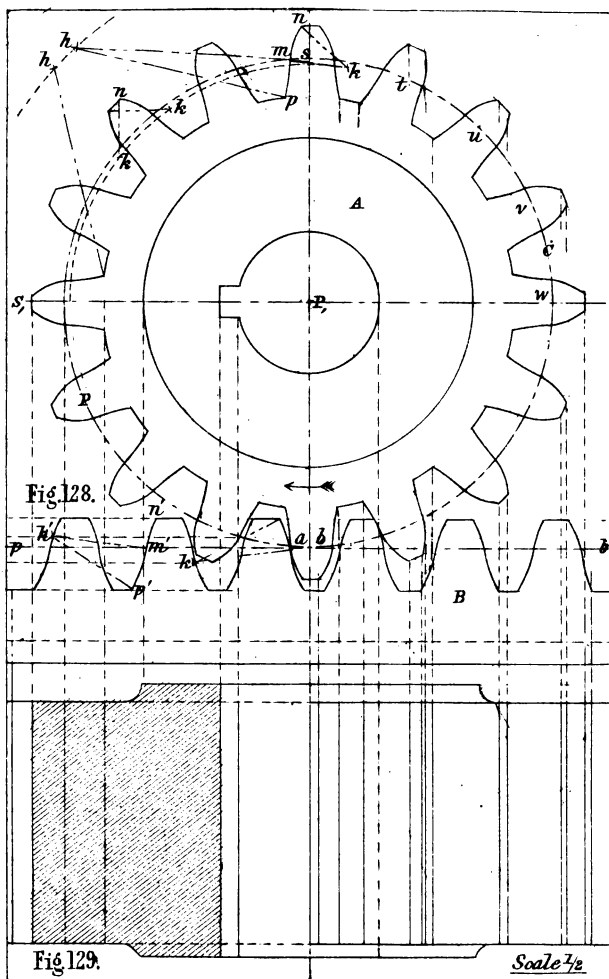
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# Plate XV.

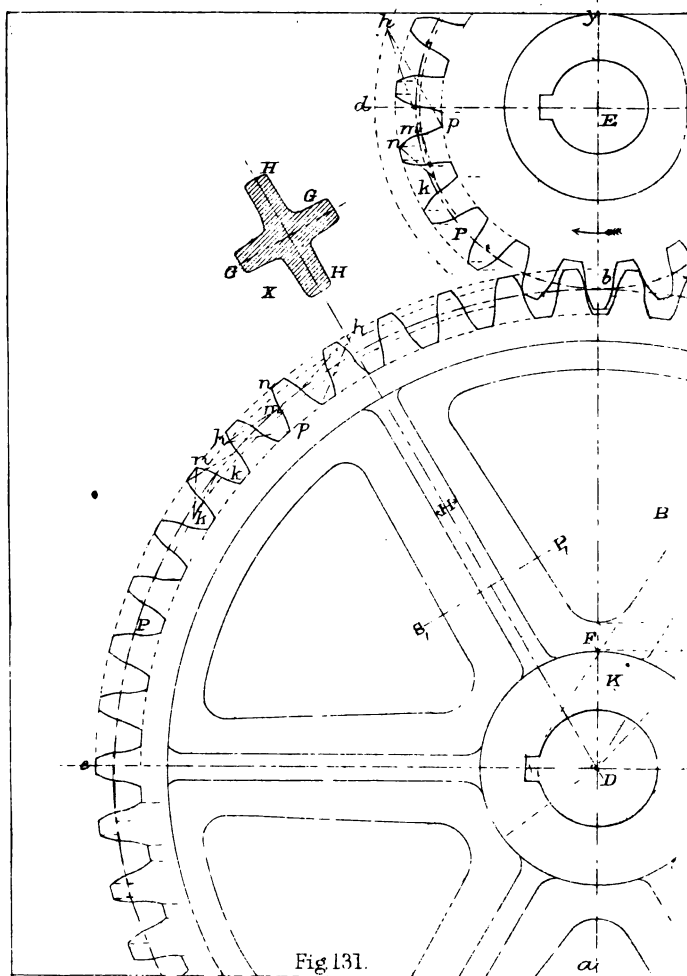












VII.

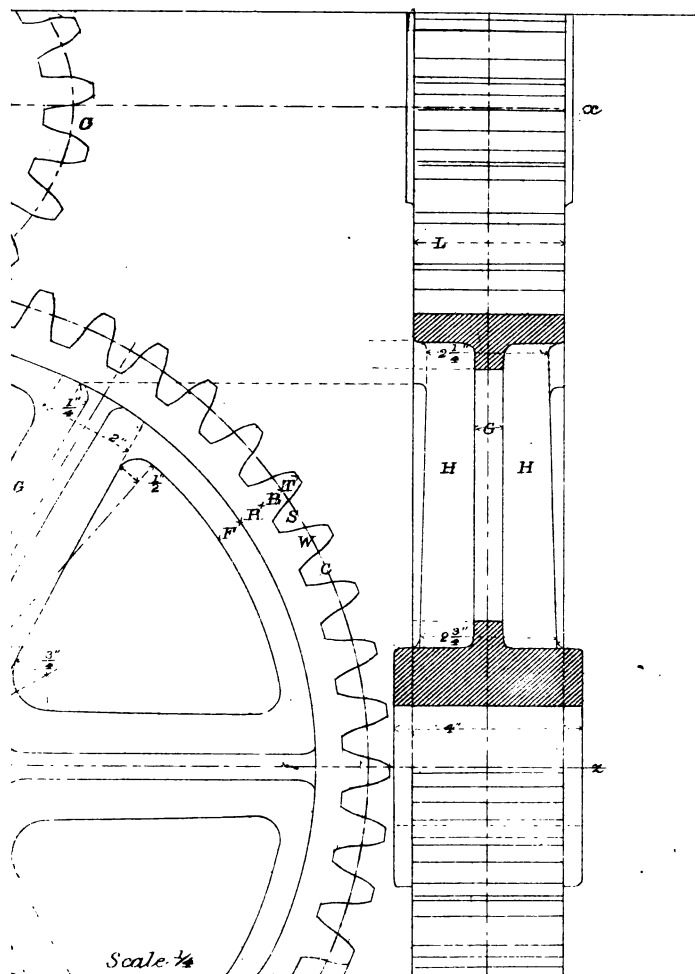
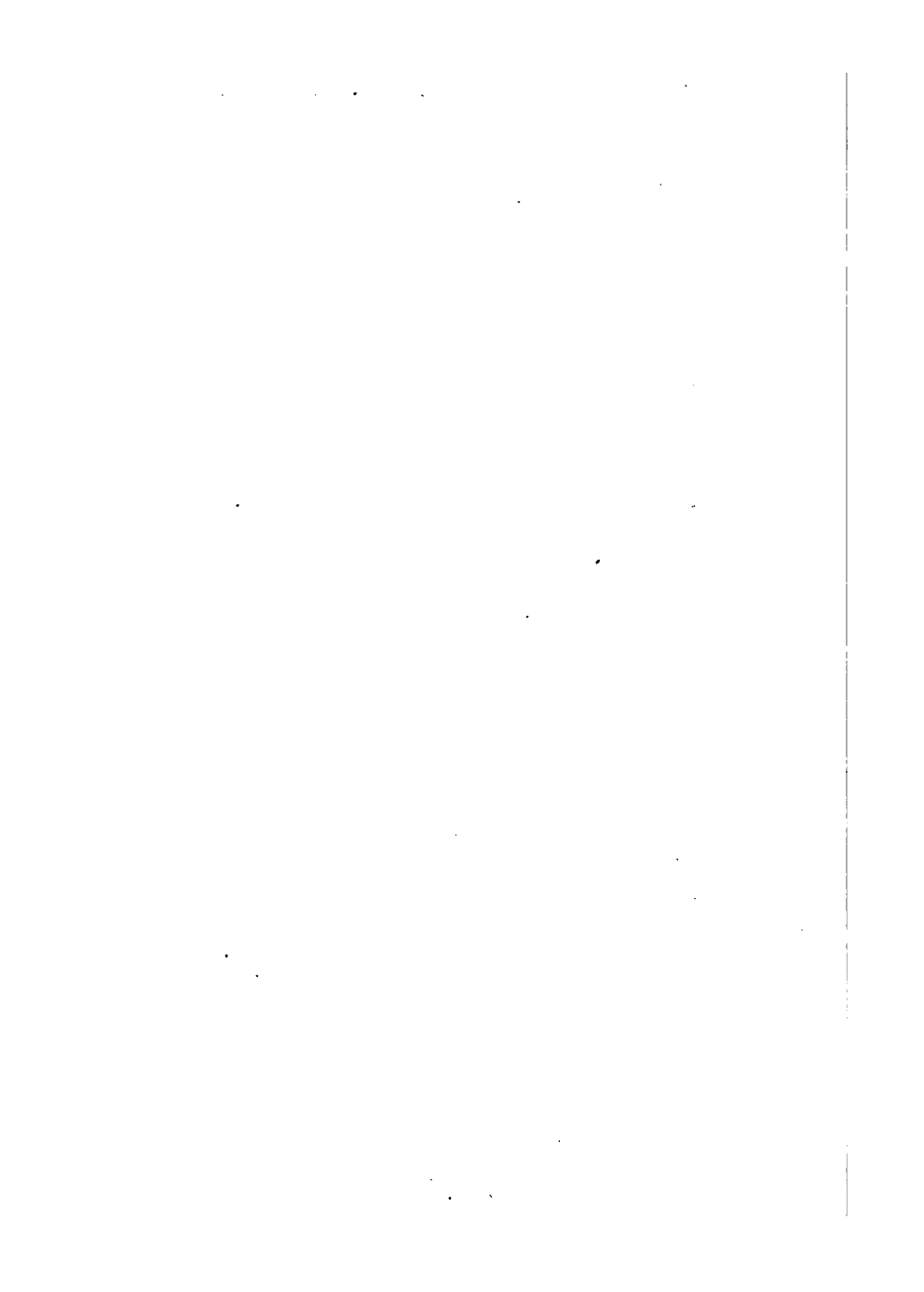


Fig. 132.





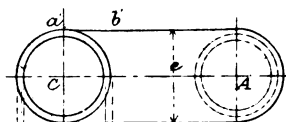


Fig 135.

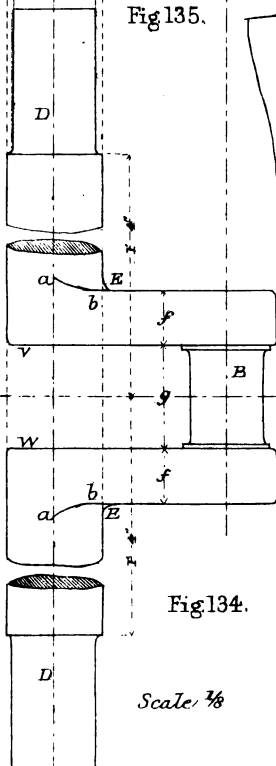


Fig 134.

Scale  $\frac{1}{8}$

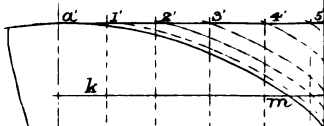
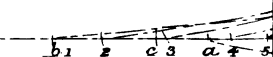


Fig 136.

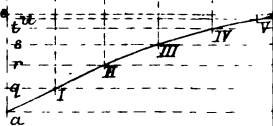


Fig 137.

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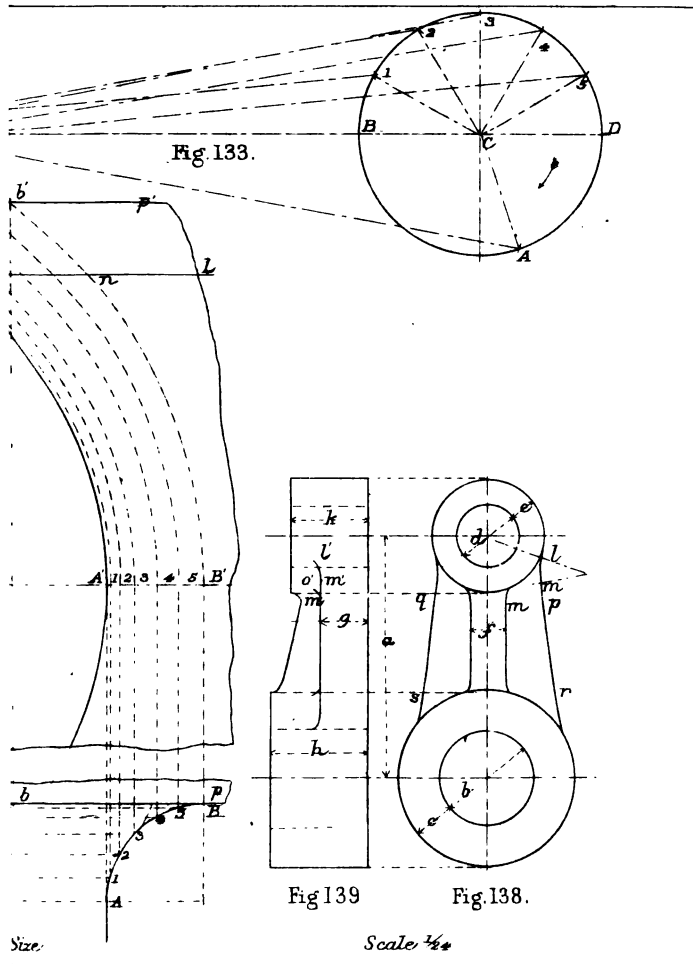


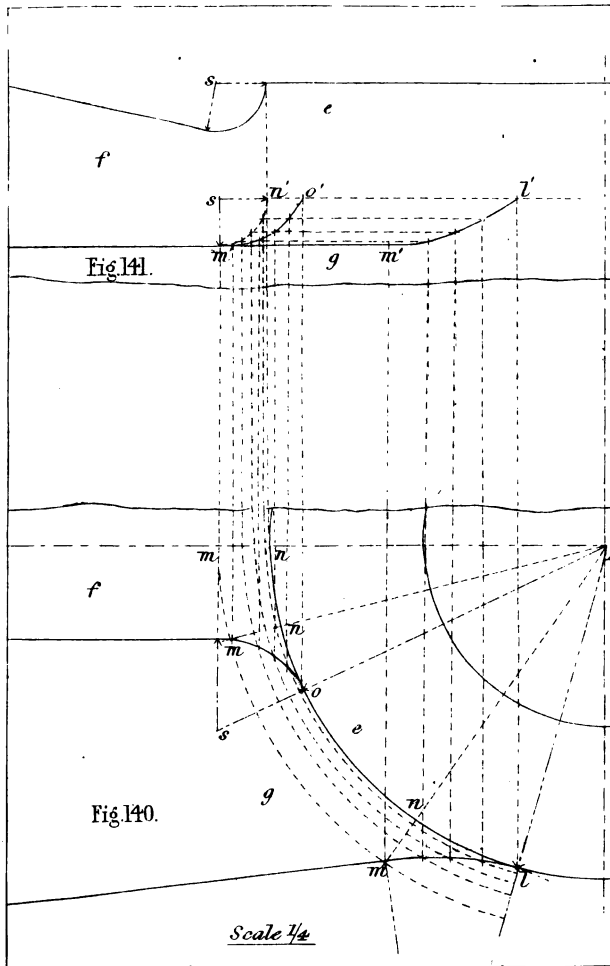


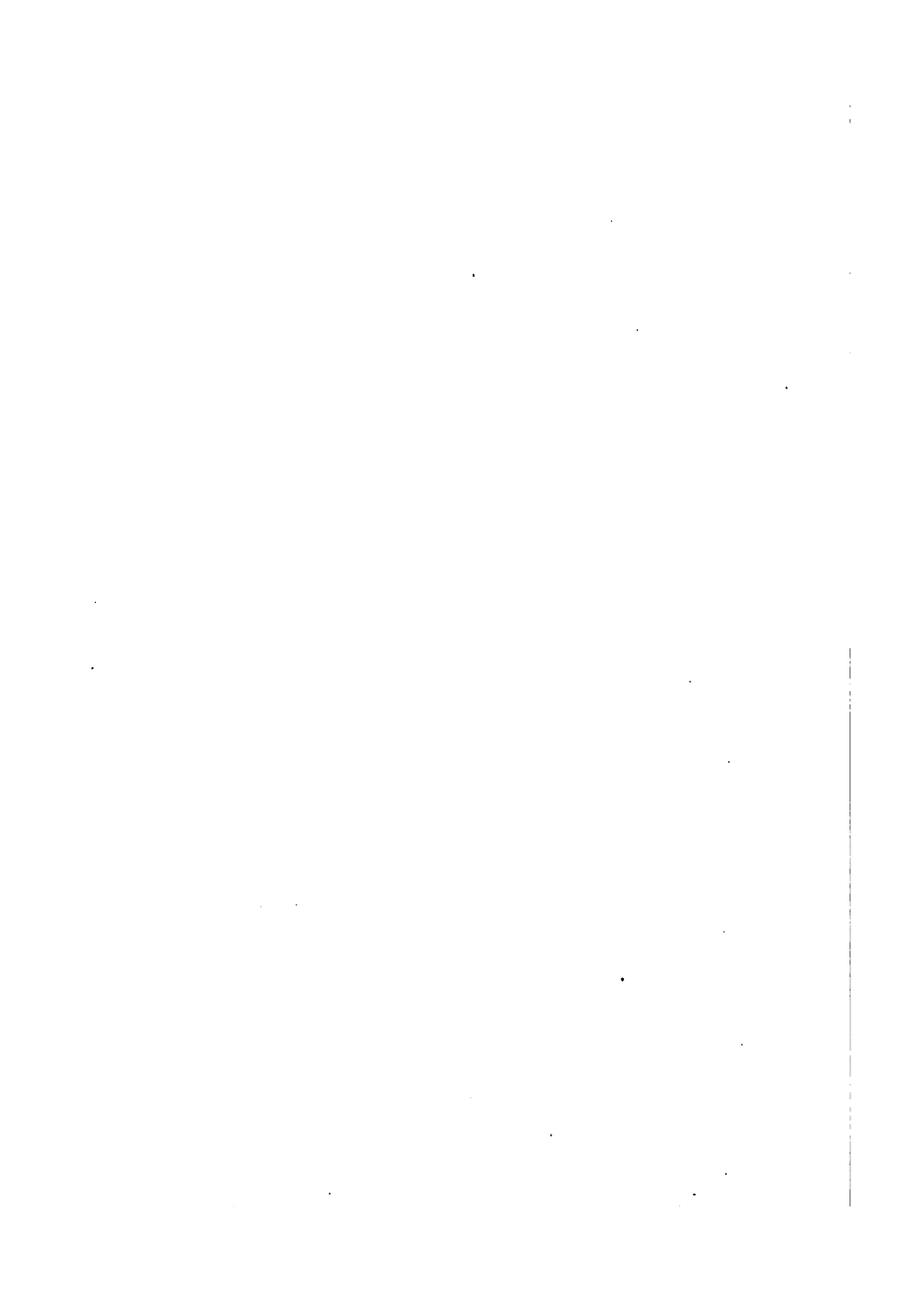






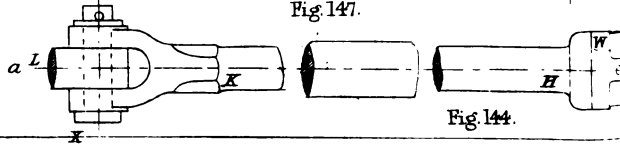
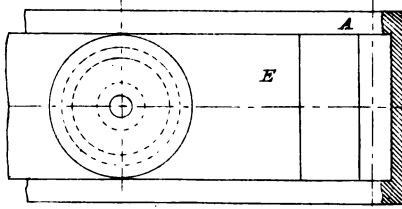
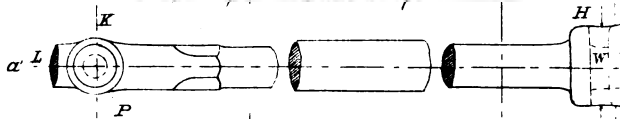
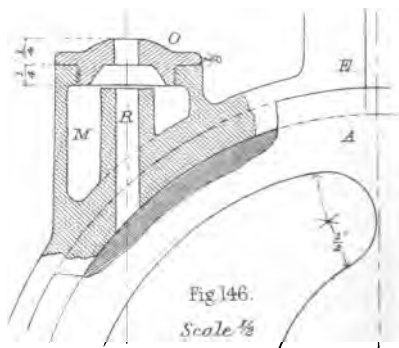
Plate XIX.

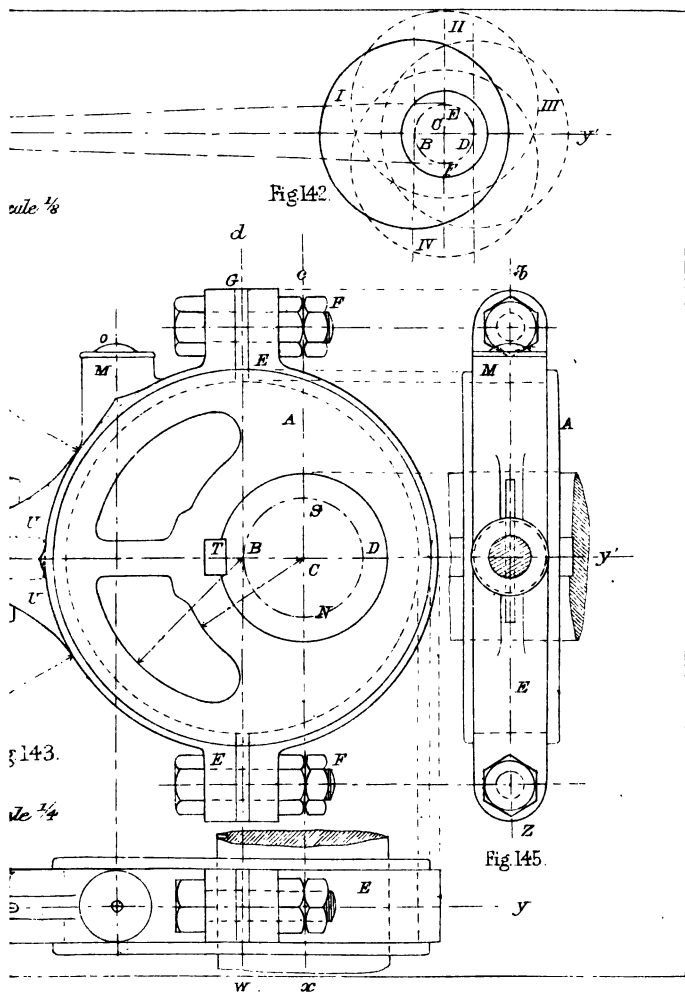






$a'$   $b$   $d$











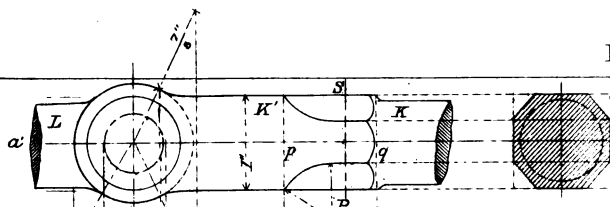


Fig 154.

Fig 155.

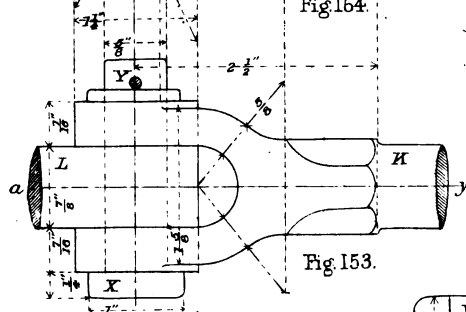


Fig 153.

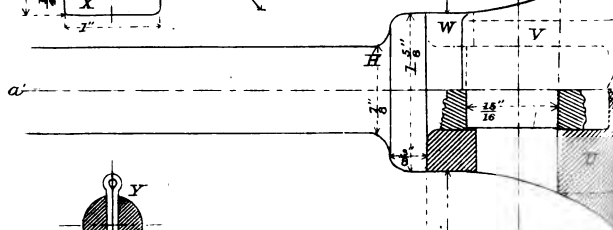


Fig 148.

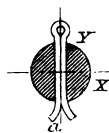


Fig 156.

Scale  $\frac{1}{2}$

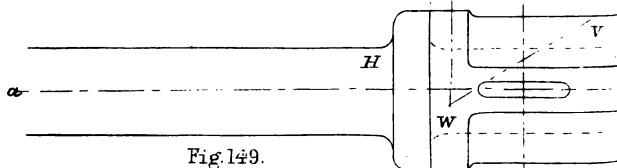


Fig 149.

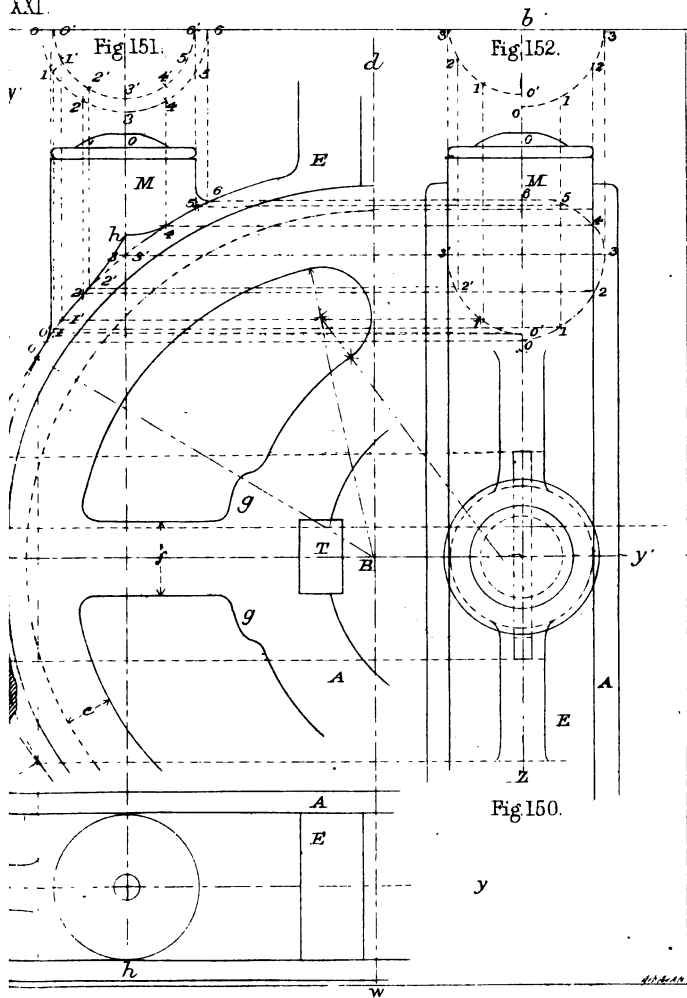
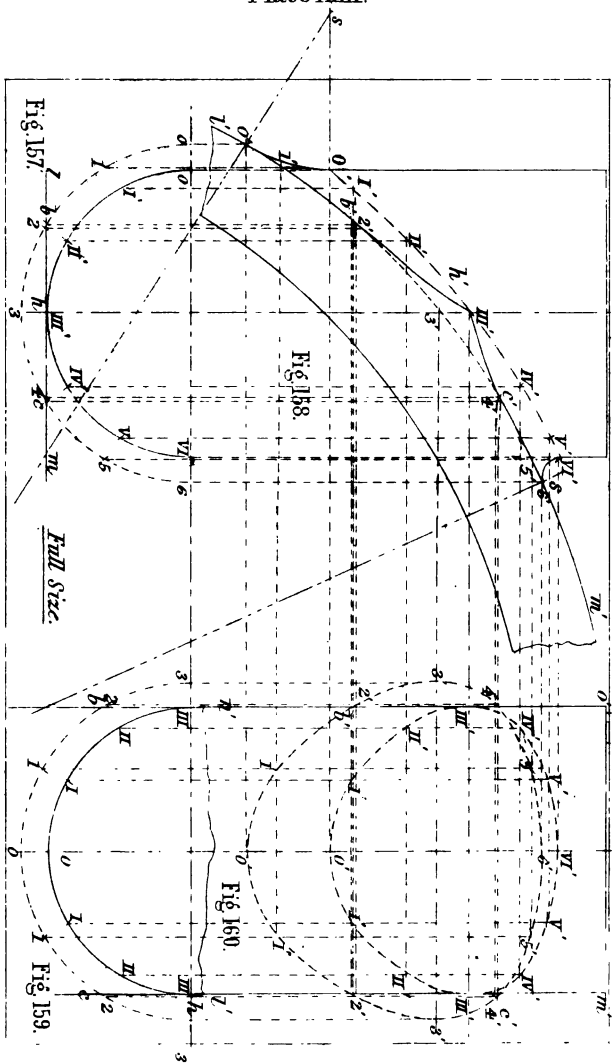








Plate XXII.









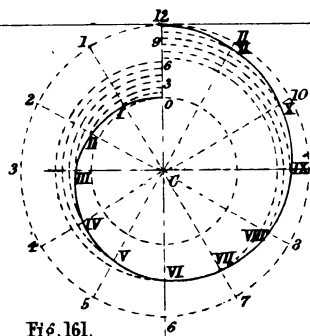


Fig. 161.

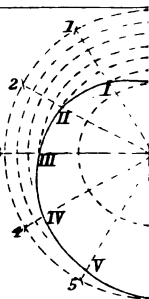


Fig. 162.

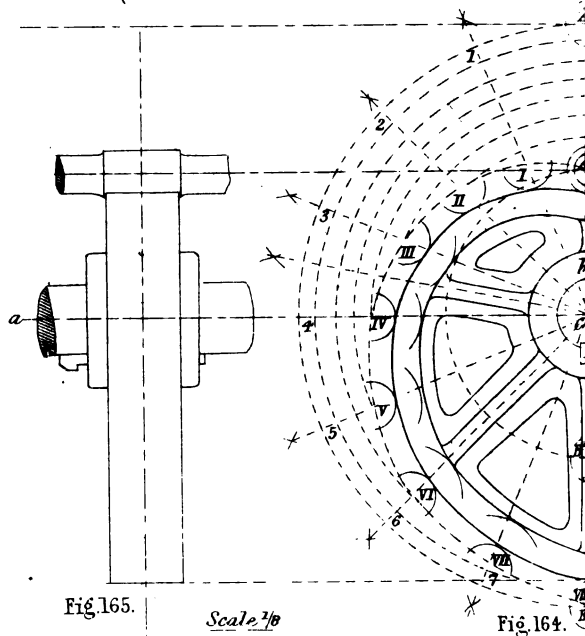


Fig. 165.

Scale 1/8

Fig. 164.

CXIII.

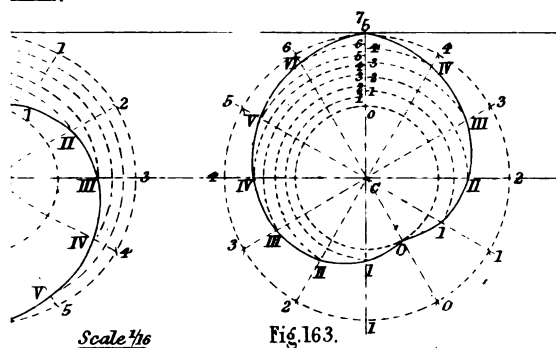


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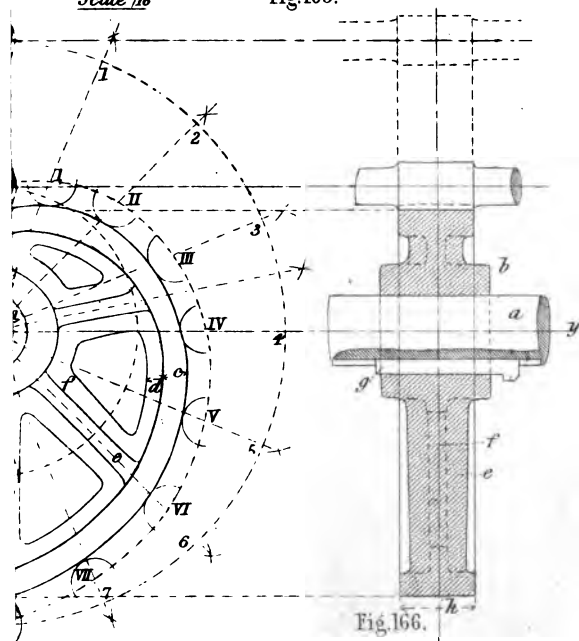


Fig. 166.





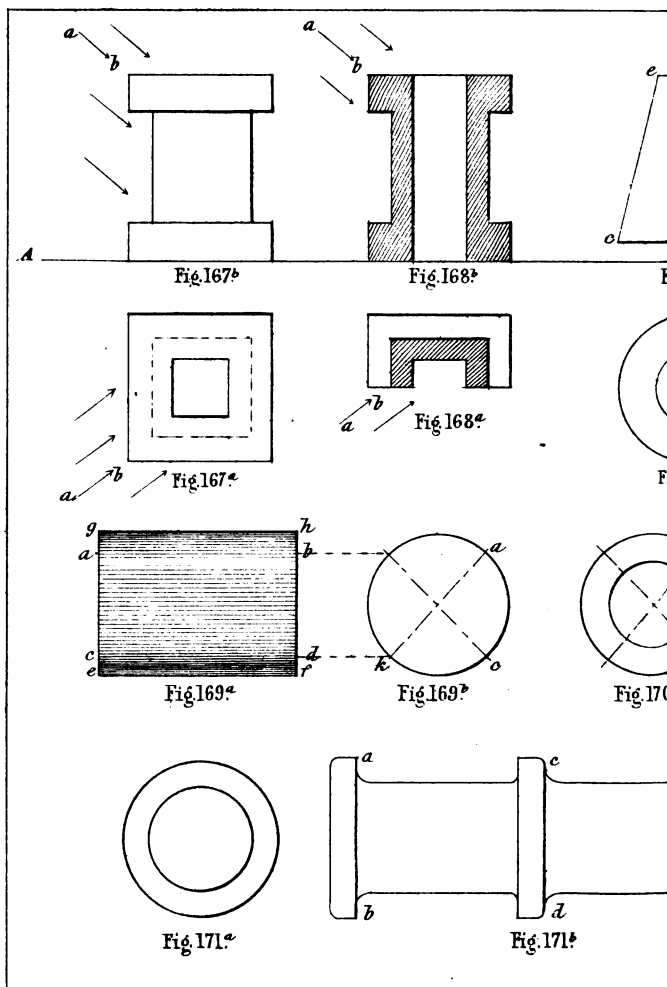




Fig. 172<sup>b</sup>

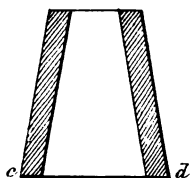


Fig. 173<sup>a</sup>

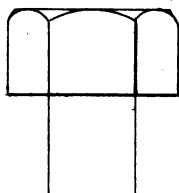


Fig. 174<sup>b</sup>

B



Fig. 172<sup>a</sup>

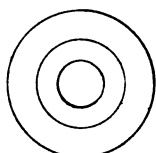


Fig. 173<sup>a</sup>

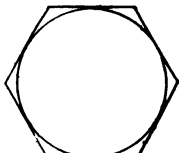


Fig. 174<sup>a</sup>

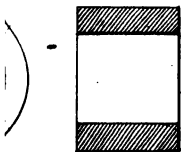


Fig. 170<sup>b</sup>

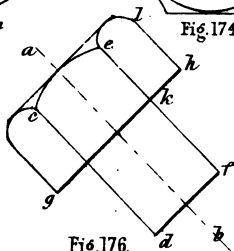


Fig. 176.

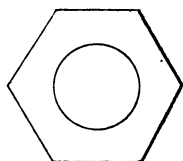
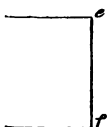


Fig. 175<sup>b</sup>

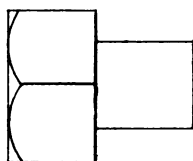
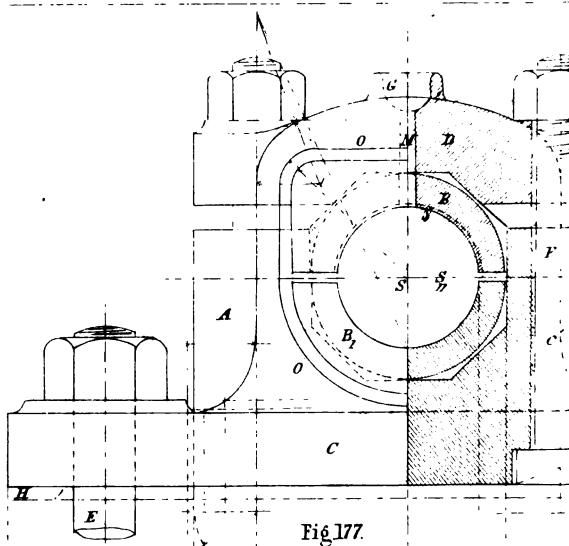


Fig. 175<sup>a</sup>

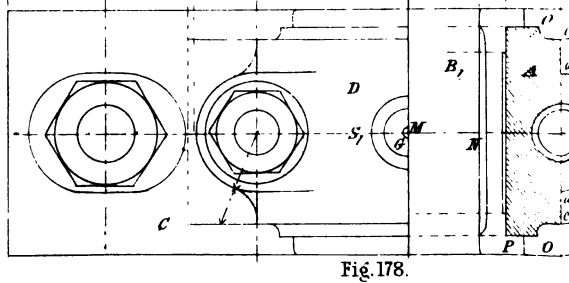


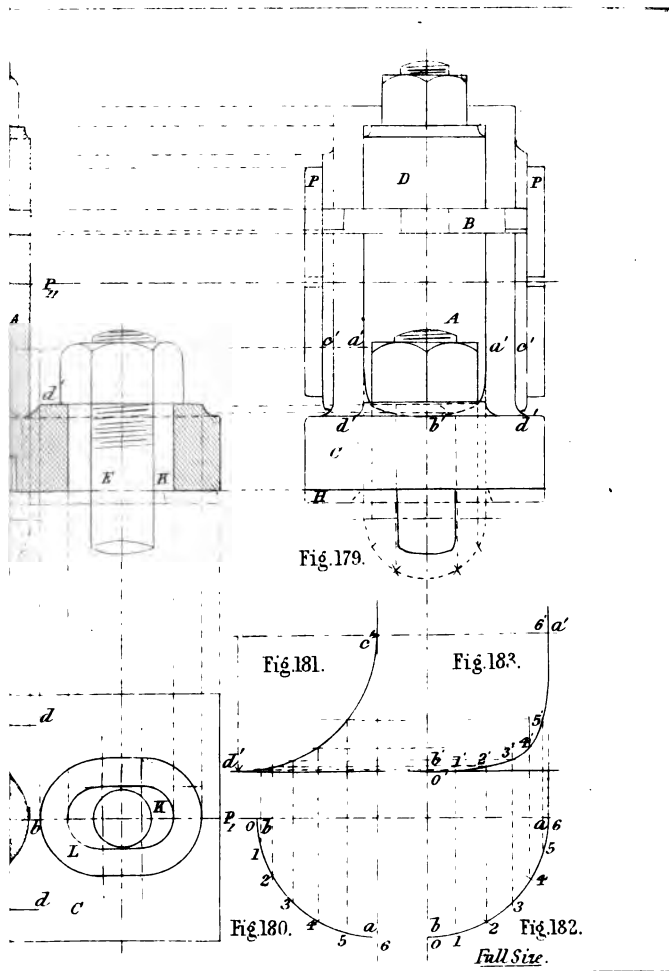






Scale  $4_2$









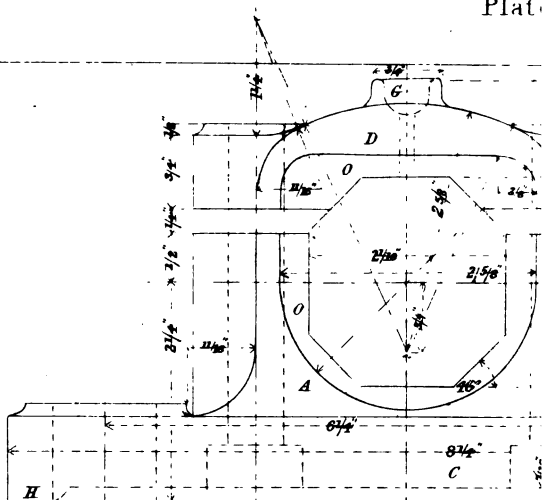


Fig.184.

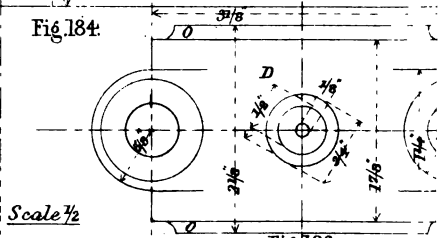


Fig. 186.

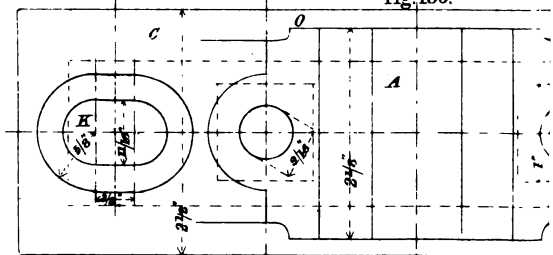
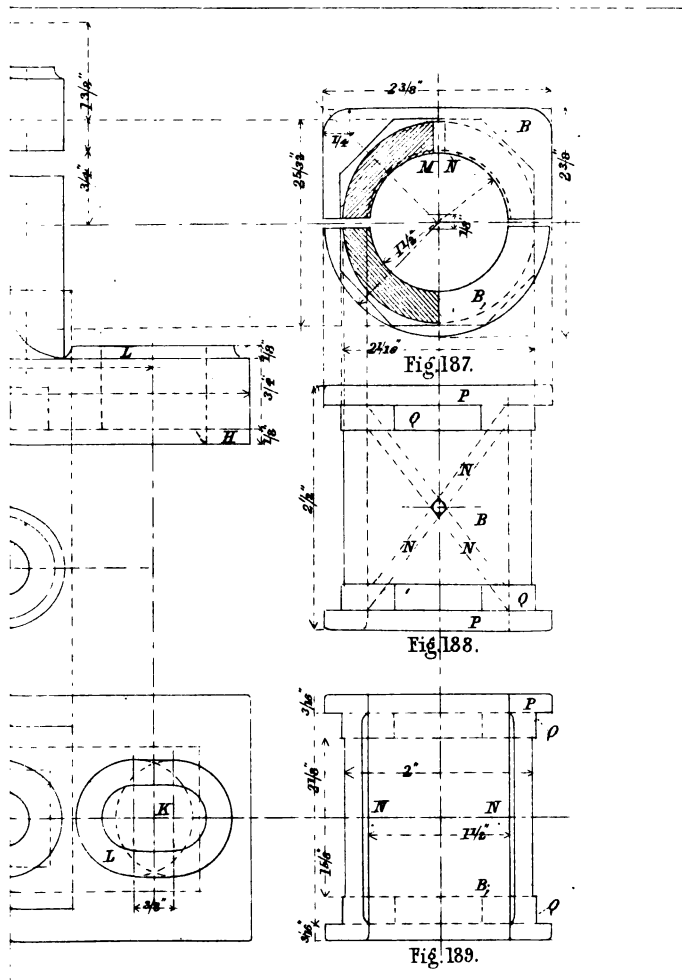


Fig. 185.









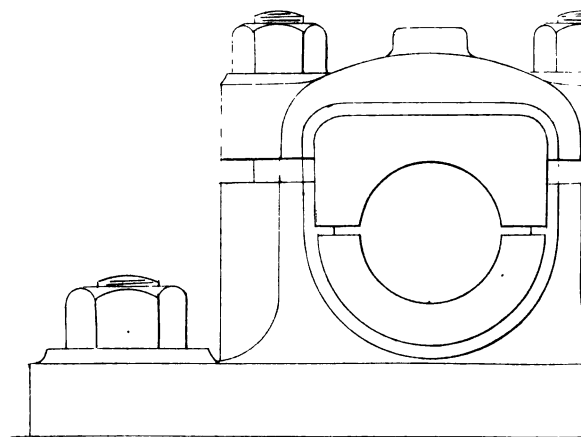


Fig.190.

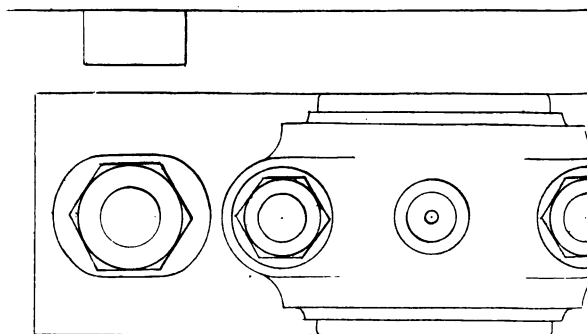
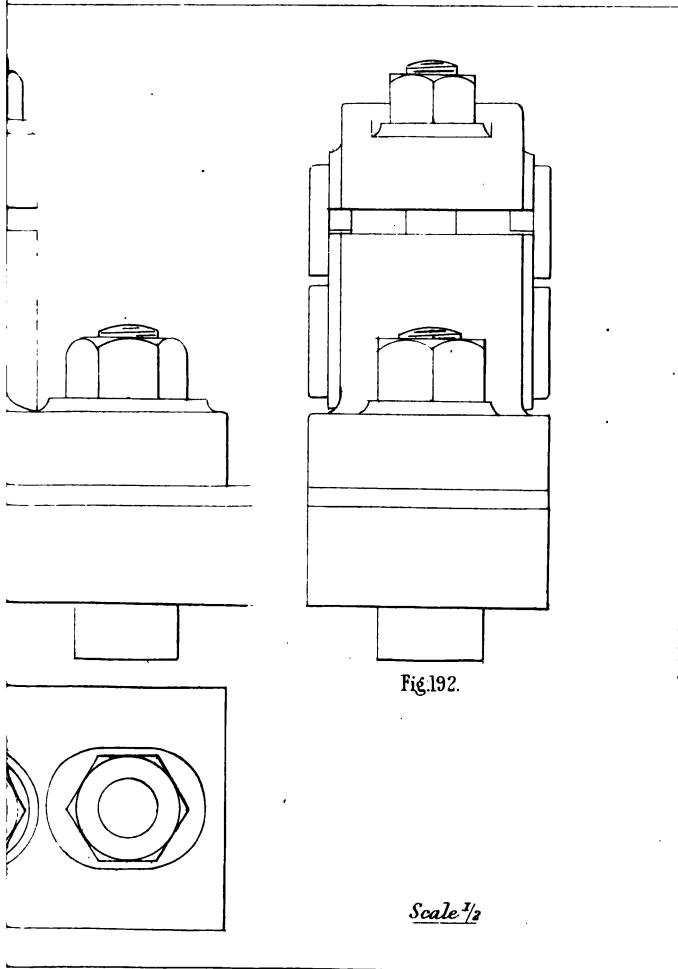


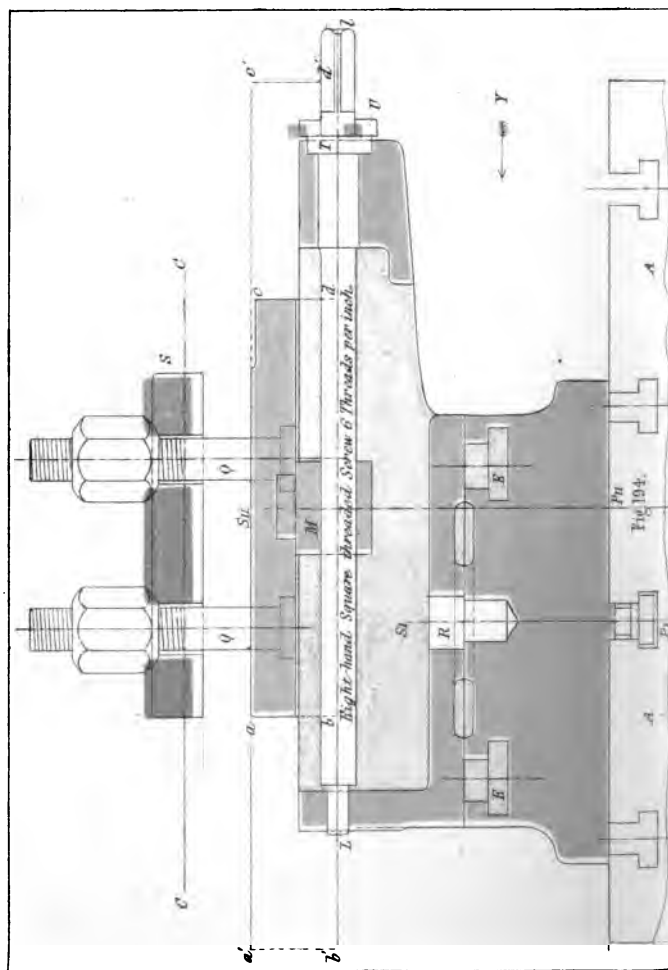
Fig.191

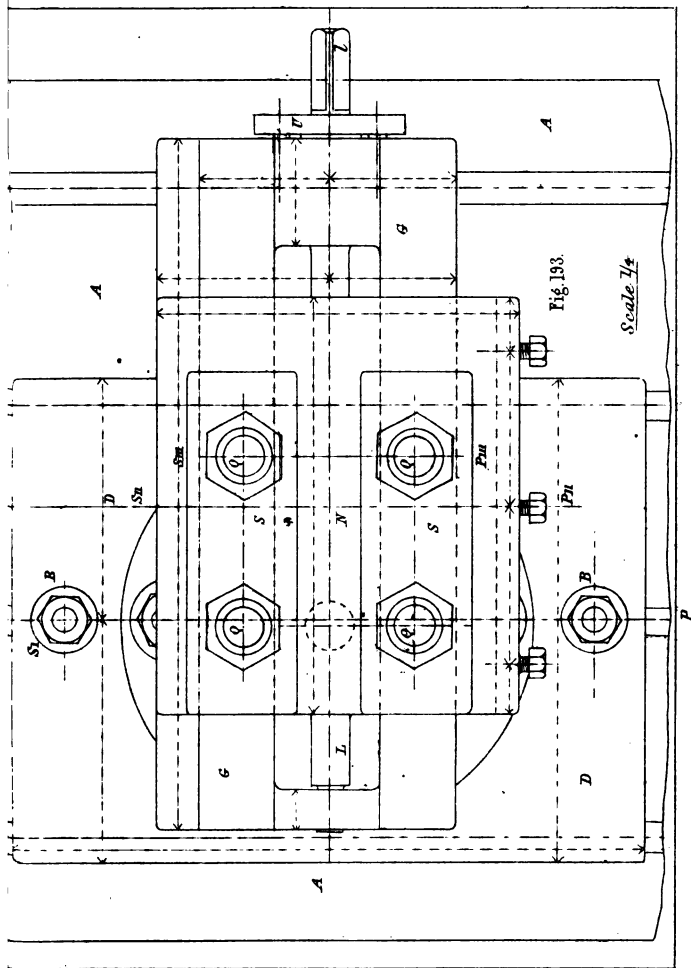
eXXVI.















1. The first part of the document is a list of the names of the members of the committee.

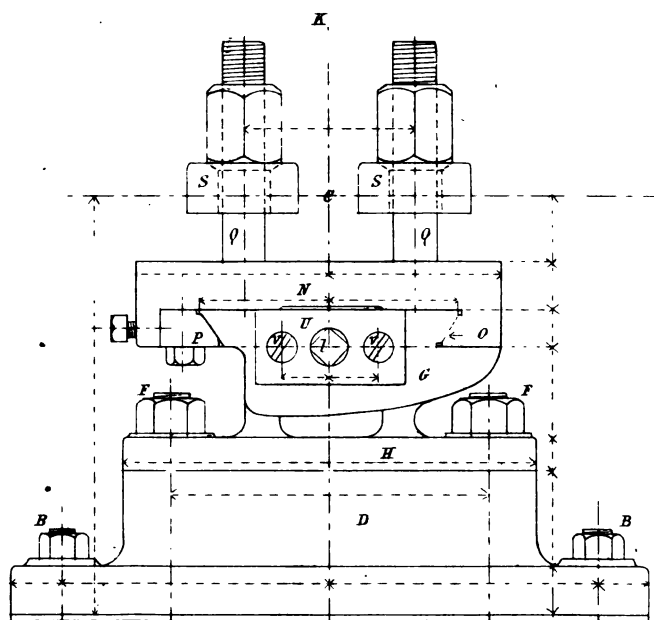


Fig. 195.

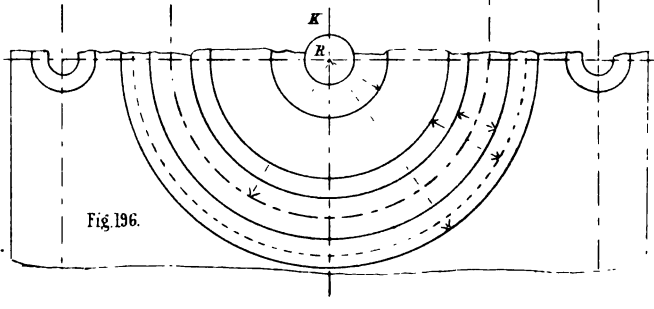
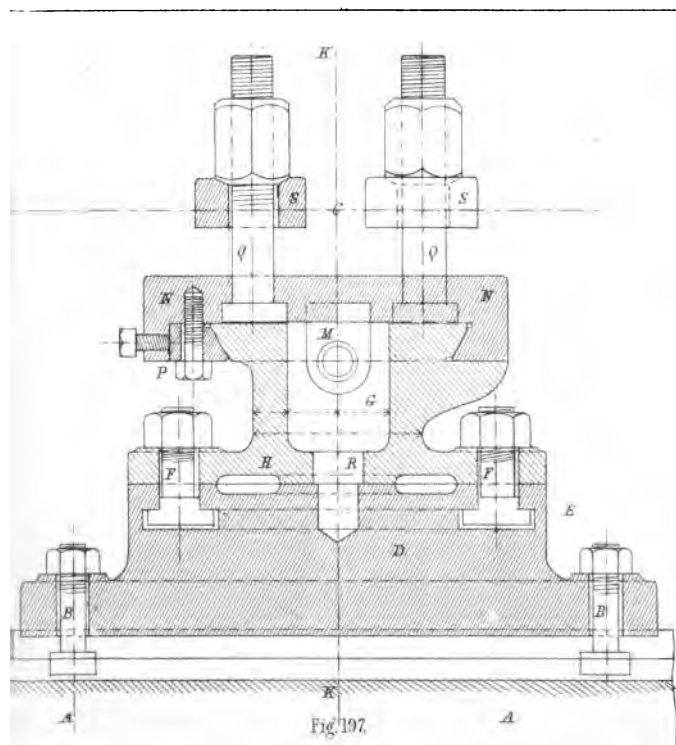


Fig. 196.



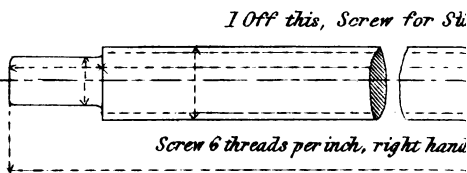
Scale 1/4"







Fig. 199.



*1 Off this, Screw for Sti*

*Screw 6 threads per inch, right hand*

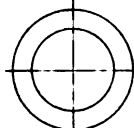
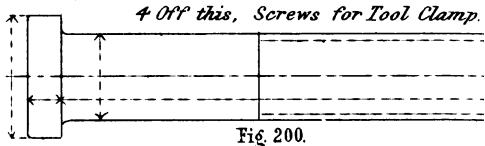
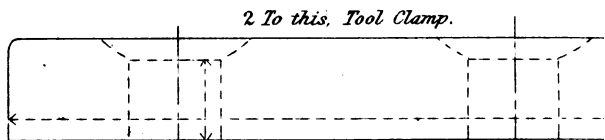


Fig. 201.



*4 Off this, Screws for Tool Clamp.*

Fig. 200.



*2 To this, Tool Clamp.*

Fig. 207

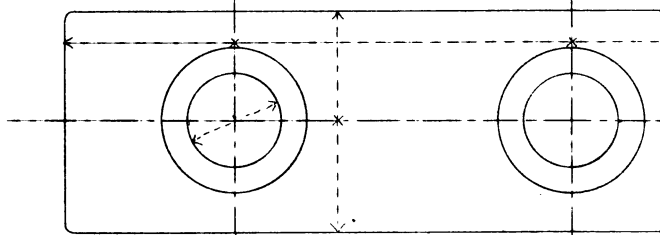


Fig. 206.

*Scale 7/2*

*NOTE. The p  
Sheet are finis*

*de-Res.*

*square thread.*

Fig 198.

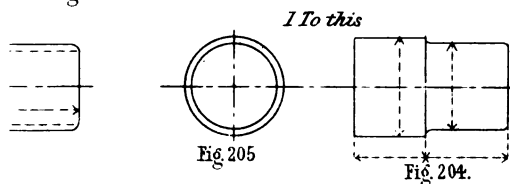


Fig 205

Fig 204.

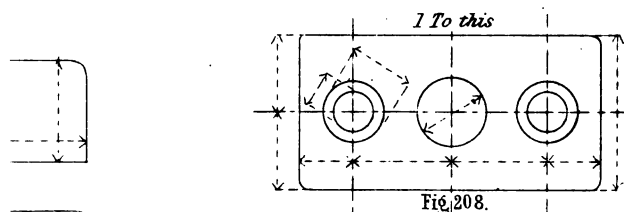


Fig 208.

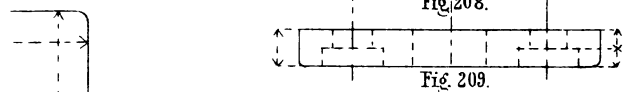


Fig 209.

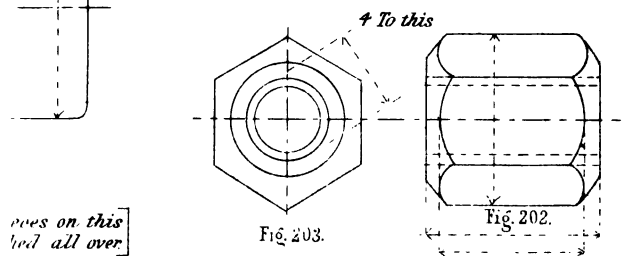


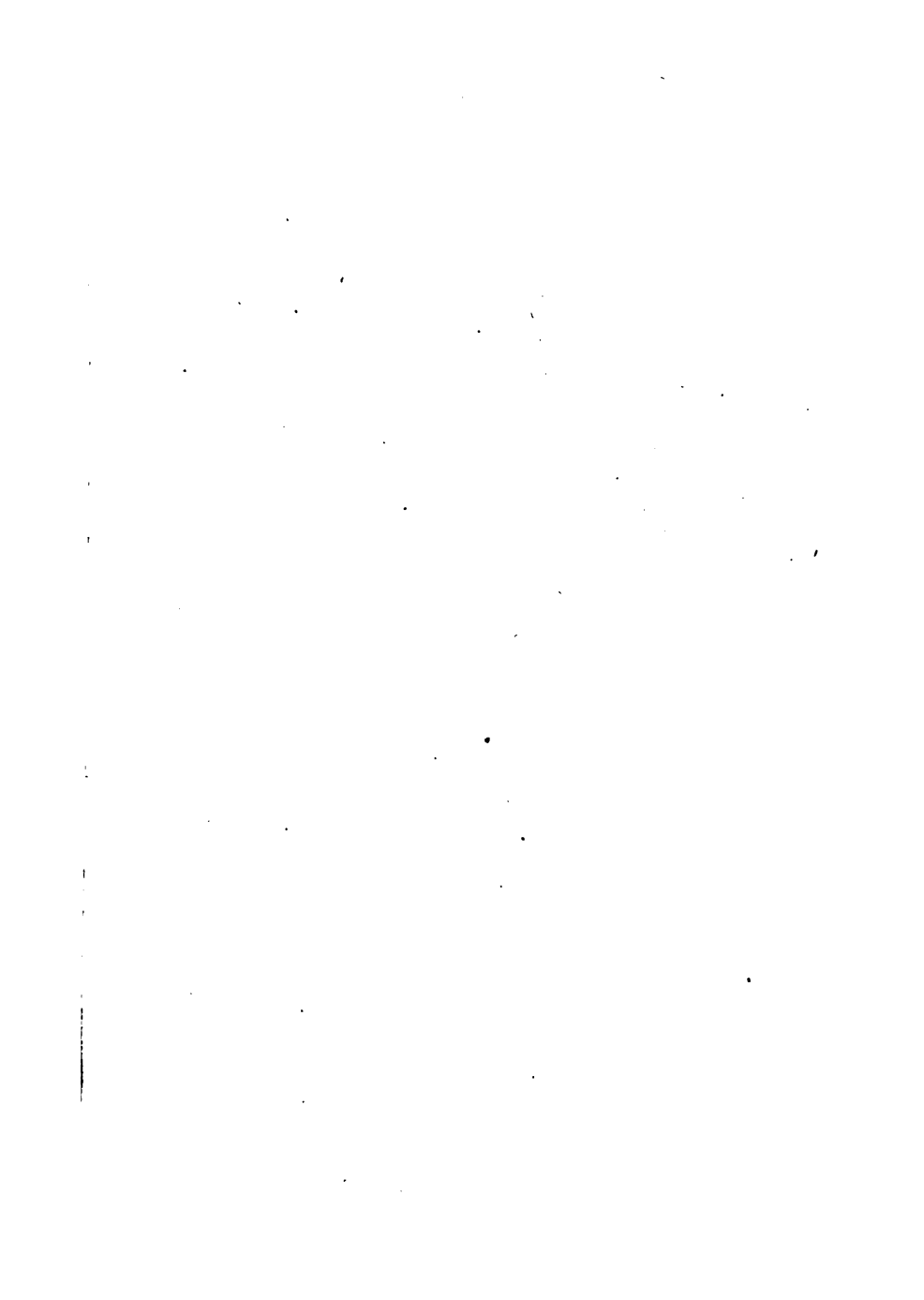
Fig 203.

Fig 202.

*ees on this  
not all over*







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